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Entrepreneurial Regions: Do Macro-Psychological Cultural Characteristics of Regions Help Solve the "Knowledge Paradox" of Economics?

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Abstract

In recent years, modern economies have shifted away from being based on physical capital and towards being based on new knowledge (e.g., new ideas and inventions). Consequently, contemporary economic theorizing and key public policies have been based on the assumption that resources for generating knowledge (e.g., education, diversity of industries) are essential for regional economic vitality. However, policy makers and scholars have discovered that, contrary to expectations, the mere presence of, and investments in, new knowledge does not guarantee a high level of regional economic performance (e.g., high entrepreneurship rates). To date, this "knowledge paradox" has resisted resolution. We take an interdisciplinary perspective to offer a new explanation, hypothesizing that "hidden" regional culture differences serve as a crucial factor that is missing from conventional economic analyses and public policy strategies. Focusing on entrepreneurial activity, we hypothesize that the statistical relation between knowledge resources and entrepreneurial vitality (i.e., high entrepreneurship rates) in a region will depend on "hidden" regional differences in entrepreneurial culture. To capture such "hidden" regional differences, we derive measures of entrepreneurship-prone culture from two large personality datasets from the United States (N = 935,858) and Great Britain (N = 417,217). In both countries, the findings were consistent with the knowledge-culture-interaction hypothesis. A series of nine additional robustness checks underscored the robustness of these results. Naturally, these purely correlational findings cannot provide direct evidence for causal processes, but the results nonetheless yield a remarkably consistent and robust picture in the two countries. In doing so, the findings raise the idea of regional culture serving as a new causal candidate,

Code, age, and gender is enough to correlate some rather high percentage of unique individuals to US Census Data.

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potentially driving the knowledge paradox; such an explanation would be consistent with research on the psychological characteristics of entrepreneurs.

Introduction

Successful and highly performing local economies generally have one thing in common—strong and robust entrepreneurial activity [1, 2]. There is empirical evidence for a positive correlation between the regional presence of small firms and regional economic development [3, 4]. In particular, in the long run, entrepreneurial activity seems to be related to economic growth (for a review of the literature see [5–7] and for studies applying causal methods see [4, 8]). While scholars debate the different definitions, manifestations, and measurement of entrepreneurship [9–12], leaders in public policy are less nuanced: Entrepreneurship is generally about the startup of new firms and businesses.

Policy makers have "discovered" entrepreneurship—startup activity in the region—as a means for enhancing regional economic development. As Chatterji, Glaeser, and Kerr [13] (p. 1) explain, the success of entrepreneurial clusters in recent decades has challenged the traditional wisdom of smokestack chasing and now many policy makers state that they want their regions to be the next Silicon Valley. This has led to extensive efforts to seed local entrepreneurship, e.g. [14], with today's politicians routinely announcing the launch of an entrepreneurial cluster in a hot industry. But how can regional entrepreneurship be fostered?

Economists have identified new knowledge (e.g., new ideas and inventions), generated through regional knowledge resources (e.g., human capital and a diverse industry mix), as one key factor contributing to regional variations in entrepreneurial activity [13, 15] because new knowledge creates key opportunities for entrepreneurs to start new firms. However, in what first became known as the "Swedish Paradox," and subsequently as the "European Paradox", policy makers and scholars discovered that the mere presence of, and investments in, new knowledge did not guarantee a high level of economic performance [16]. Something was missing.

In this paper we suggest that what has been missing can be found in a very different scholarly literature, psychology. Just as the discipline of economics has traditionally explained economic performance in terms of "hard" factors and inputs, ranging from natural resources, to physical capital, and more recently to knowledge and ideas, the discipline of psychology has focused on "soft" and more "hidden" factors such as culture. Such macro-psychological features of whole regions are receiving growing attention in contemporary psychological science [17–20]. Mapping cultural factors into a spatial context might shed light on the "knowledge paradox" of economics. Regional differences in entrepreneurial culture [1, 21–23] may be a key hidden factor moderating the relationship between knowledge and economic activity; specifically, people in some regions might live in a local culture that predisposes or at least enables them to act upon new knowledge and ideas they have by starting a new business [1]. Thus, in this paper we propose that the degree of entrepreneurship is linked not just to knowledge in the region but rather to the interaction between knowledge and culture. Accordingly, new knowledge will have a greater propensity to generate entrepreneurship in regions with a pronounced entrepreneurial culture where the predominant attitudes and norms reinforce individual's decisions to act upon entrepreneurial opportunities [24, 25]. Thus, we follow the definition of entrepreneurship put forward by Shane and Venkataraman [10] as the nexus between enterprising individuals and the entrepreneurial opportunity they pursue.

Entrepreneurship research has long considered the potential role of cultural factors. In fact, many economists deem cultural factors a crucial driver of economic performance and development in general [21, 26] and entrepreneurship in particular, e.g., [22, 24, 25, 27–29]. We contribute to this research by employing a personality-based measure of entrepreneurial culture, looking at relatively small spatial units (e.g., cities), and focusing on the interplay between knowledge and culture.

We test our novel knowledge-culture interaction hypothesis in the context of two major economies–the United States (US) and Great Britain (GB). This design allows to test whether the results replicate across two countries and independent datasets. In the following, we first provide the background of our personality-based measure of entrepreneurial culture and then develop our basic hypothesis regarding the interplay between knowledge and an entrepreneurial culture in predicting regional entrepreneurship activity. We then continue by describing the methods, results, and discussion. A series of robustness checks is presented in the S1 Information.

Quantifying Regional Differences in Entrepreneurial Culture

Culture can be seen as "the collective programming of the mind that distinguishes the members of one group or category of people from another" [30]. In the psychology literature, such collective mental characteristics of populations are assessed in different ways, including via prevalent values [30, 31] or personality characteristics [32, 33]. Prevalent values and personality traits are interacting parts of the local culture as suggested by the Five-Factor Theory of Personality [34] and Rentfrow, Gosling, and Potter's theory of the emergence, persistence, and expression of geographic variation in personality characteristics [19]. According to these theories and related research, e.g., [35], aggregate-level personality characteristics get expressed via corresponding values and norms in the region. Hofstede and McCrae [35] stress that there is convincing empirical evidence suggesting that "culture-level traits can be legitimately operationalized as the mean of individual trait levels" (p. 79). Following this argument and earlier research on regional personality differences, e.g., [19], we aggregate individual-level personality scores at the regional level to obtain a basic measure of the local entrepreneurial culture. We thus follow the personality-based approach of quantifying regional differences in entrepreneurial culture [24, 28, 29, 36].

In the psychological literature, there are different models of an individual's personality. Following existing research on individual and regional entrepreneurial personality characteristics [37], we draw from the Five-Factor Theory of Personality (the Big Five traits; [34]), which is the predominant personality model in contemporary psychological science. The Big Five approach is the most cross-culturally validated model of personality [38–41], making it particularly useful for our research comparing entrepreneurship in two separate countries.

Research from the emerging field of the geography of psychology has established that the prevalence of the Big Five traits varies across regions [18]. Moreover, both theorizing on regional personality differences [19] and research investigating the historical roots and trajectories of regional personality features [42] indicate that regional personality differences persist over time. For example, Voigtlaender and Voth show that anti-Semitism in medieval German regions can explain regional patterns of anti-semetic sentiments 500 years later [43]. Becker and Woessmann find that the spread of protestant values after Reformation impact literacy rate of the general populace in 19th century Prussian regions, which in turn predicted economic performance of these regions [44]. Likewise, many regional entrepreneurship scholars argue that a regional entrepreneurial culture persists over time. The litmus test for this argument is the presence of persisting differences in regional entrepreneurship rates that is found in many Western market economies such as the US [45], the UK [46], Germany [47], the Netherlands

[48], and Sweden [22]. A recent study by Fritsch and Wyrwich [27], comparing entrepreneurship rates in East Germany from the early 20th century and today's rates, demonstrates that an entrepreneurial culture can persist several decades and survive even massive social-economic turmoils (i.e., a World War, deep economic recessions, and a long phase of socialism). Most importantly, the correlation between past and contemporary entrepreneurship rates is still significant after controlling for structural economic characteristics that could serve as an alternative explanation for the re-emergence of entrepreneurship in East Germany. This finding suggests that an entrepreneurial culture is deeply rooted in the region [27].

Drawing from earlier research on regional entrepreneurial personality differences [37], we focus on a constellation of the Big Five traits to measure an entrepreneurial personality profile at the individual level and then aggregate it at the regional level. This procedure follows the logic of the person-oriented approach of assessing the individual's personality [49, 50]. This approach stresses that the configuration of a person's traits is more than simply the sum of the person's single traits because the "individual functions as a totality" [50] (p. 463). Seminal theorizing argues that the entrepreneur is best characterized as a specific type, defined by a combination of personality traits [51, 52, 53]. Indeed, there is convincing evidence that an entrepreneurial constellation of the Big Five traits within the person reliably predicts entrepreneurial activity [37]. Such an intraindividual configuration is characterized by high levels of extraversion, conscientiousness, and openness, and lower scores of agreeableness and neuroticism.

It is clear that this personality profile and entrepreneurial behavior are related, but does having a certain personality make entrepreneurial behavior more likely or does the entrepreneurial behavior lead to a change in personality? Research from a number of different traditions clearly points to the causal primacy of personality in this relationship. First, developmental studies have established that the Big Five traits are relatively stable over the life course [54], which is explainable by their strong genetic basis [55]. Consistent with this biological perspective, genetic entrepreneurship studies have identified a link between genes, the Big Five, and entrepreneurial behavior [56]. Thus, the strong genetic base of the Big Five eases endogeneity concerns regarding the region-level relation between the personality profile and economic variables such as entrepreneurial behavior [57]. Second, research has shown that an entrepreneurial constellation of the Big Five traits within the person predicts not only entrepreneurial behavior but also conceptually underlying psychological variables (e.g., entrepreneurial intentions, attitudes, self-efficacy, risk-taking, self-identity, and control beliefs) and economic variables (e.g., entrepreneurial human and social capital) at the individual level (see [37, 58]). Third, evaluation research has shown that those founders scoring low in this entrepreneurial personality profile benefit most from public business advice (e.g., due to a lack of human and social capital, [59]). Fourth, longitudinal research investigating the early formative years of entrepreneurs has found that an entrepreneurial personality profile channels a person's vocational development towards entrepreneurship in adulthood from early on (e.g., by stimulating early enterprising career interests or early entrepreneurial competencies in adolescence, [60]). This research further shows that the entrepreneurial personality profile, measured as early as in adolescence, is able to prospectively predict entrepreneurial behavior over the subsequent occupational career. Finally, research at the regional level suggests that regions in the US (US states), UK (government regions), and Germany (federal states) scoring higher in the entrepreneurial personality profile also consistently exhibit higher entrepreneurship rates [37]. Specifically, in-depth analyses at the US state-level indicate an interaction between the region's entrepreneurial personality profile and supportive business conditions (e.g., with regard to venture capital financing, business incubators, labor supply, business costs, infrastructure, and the legal and regulatory environment); those US states exhibiting both a prevalent entrepreneurial

culture, indicated by high scores in the entrepreneurial personality profile, and supportive business conditions attain the highest entrepreneurship rates. In summary, the preponderance of evidence suggests that it is personality that drives entrepreneurship, not the other way around.

The Culture X Knowledge Interaction Hypothesis

Above we referred to Shane and Venkataraman's view of entrepreneurship as the nexus between opportunities and enterprising individuals. These authors were building on Casson's [61] definition of opportunities, which views entrepreneurial opportunities as "those situations in which new goods, services, raw materials, and organizing methods can be introduced and sold at greater than their cost of production" [10] (p. 220). Such opportunities often arise from a recombination of existing knowledge pieces to create new knowledge and means-ends relationships. Thus, a region with high knowledge resources might have the potential for more entrepreneurial activity compared to a region with limited knowledge resources [15].

Shane and Venkataraman [10], along with most other scholars of entrepreneurship, make it clear that having knowledge may be necessary for an entrepreneurial opportunity but it is not sufficient to constitute entrepreneurship [9]. Rather, along with the recognition or creation of such an entrepreneurial opportunity, entrepreneurship also requires action or behavior, because any such opportunity must be exploited or actualized in order to be considered *bona fide* entrepreneurship. Thus, we argue that the presence of new knowledge is not a sufficient condition for entrepreneurship. Regions must have a high entrepreneurial culture for people to start businesses based on the available opportunities. This argument builds on Denzau and North's [62] concept of shared mental models. According to these authors, mental models can be understood as internal representations that are created by one's cognitive systems. They aid interpretation of the environment and thus have a strong impact on individual decision making. Mental models are not stable. Instead, they are updated by new experiences. Such new experiences can strengthen and confirm initial cognitive representations of the world or they can lead to modifications of the mental model via learning. The shape of the individual mental model is thus shaped by contact with others in one's environment.

No two individuals are confronted with the same set of experiences in life so different individuals' mental models will differ. However, Denzau and North [62] argue that cultural heritage ". . .provides a means of reducing such divergence by encapsulating experience of past generations" [62] (p. 15). This heritage leads to the emergence of so-called shared mental models. These shared mental models are reflected in the values, beliefs, and traits of a community, which are transmitted over generations via socialization at school, by one's parents, or by contacts with members of the community. These shared mental models will influence the way an individual interprets information, and his or her subsequent decisions [62].

The entrepreneurship culture of a region can be understood as such a shared mental model. Consider the following thought experiment of two regions with the same high endowment of knowledge: Region A has a pronounced entrepreneurship culture. Entrepreneurship is widely approved as a career choice and if a new business fails this is seen as a learning experience, which will increase an entrepreneur's chances of future success. In region B, entrepreneurship is not viewed as an accepted way to earn a living. In fact, in region B, entrepreneurs might be seen as exploiting labor. Entrepreneurs would be isolated and treated as outsiders of the community. If an entrepreneur fails in region B, he or she might even face discrimination resulting in high financial and psychological costs. For example, failed entrepreneurs in Germany—arguably a country with a low entrepreneurial culture—face difficulties to re-enter entrepreneurship [63] and entrepreneurs in France are penalized at the labor market by receiving lower wages [64]. It is quite evident that in Region B people would think twice before engaging

in entrepreneurship, while in Region A people would have less reservations to engage in entrepreneurship.

Summarizing the above, the regional presence of new knowledge seems to be a necessary but not a sufficient condition for entrepreneurship. It still needs entrepreneurial agency in the local population to exploit this knowledge. Hence, it might be the presence of regional entrepreneurship culture that makes people more likely to act entrepreneurially and pursue these knowledge-based opportunities. In regions that have both—high knowledge and high entrepreneurship culture—we should see higher entrepreneurship rates. Accordingly, the main hypothesis of this study holds that there will be a statistical interaction effect between regional knowledge and regional entrepreneurship culture on regional entrepreneurship rates. Specifically, the positive relationship between regional knowledge and regional entrepreneurship rates should be stronger in regions with a high entrepreneurship culture compared to regions with a low entrepreneurship culture.

Methods

By means of the correlational data we utilize it is possible to determine the degree to which the interaction between knowledge and entrepreneurial culture statistically predicts regional entrepreneurship rates. Do those regions with high entrepreneurship rates indeed show a characteristic pattern of high knowledge *and* entrepreneurial culture levels? Nonetheless, we must stress that these correlational data cannot test for causality. Hence, our analyses should be understood as purely statistical predictions and not as direct evidence for causal effects; of course, the findings may, nonetheless, point to some interesting and potentially new causal candidates (in our case, regional culture).

To examine our interaction hypothesis, we combine and analyze economic and psychological data of regions in the US and GB. In the US, the regional level of analysis is 366 Metropolitan Statistical Areas (MSAs), and in GB it is 375 Local Authority Districts (LADs). In the following, we describe the main variables used in this study. Detailed information on the regional units and the datasets is presented in the Supporting Information Appendix (Section 1 in S1 Information). The SI also contains the descriptive statistics and correlations for all variables.

Entrepreneurship Rates

Our main dependent variable, *entrepreneurship rate*, is defined by regional start-up rates (number of start-ups / 1,000 employees) in the US and in GB. Regional start-up rates are the most common measure of entrepreneurship at the regional level, e.g., [45, 47, 48], but we should note that it does not capture all entrepreneurship activities covered by Shane and Venkataraman's [10] definition of entrepreneurship. Our measure of entrepreneurship is based on the *number of start-ups* in a region. Data on US start-ups come from the Statistics of U.S. Businesses (SUSB) provided by the US Census. SUSB covers all US business establishments that have employees [65]. Every business establishment with at least one employee is assigned with a unique identification number and thus can be followed over time. If an establishment hires an employee for the first time, it is assigned with an identification number and counted as a start-up.

In GB we use data from the Inter Departmental Business Register (IDBR). The IDBR is a structured list of UK businesses. IDBR builds on two main data sources—the Value Added Tax (VAT) system from Customs & Excise and Pay As You Earn (PAYE) from Inland Revenue. Supplementary inputs to the IDBR come from official statistics provided by Companies House and ONS business surveys but also from private business information providers. Start-ups are

identified by comparing the active business population in two consecutive years—a business not being active in year t-1 but active in year t is regarded as a start-up in year t.

The number of start-ups in a region naturally depends on the region's population size. We account for this by using entrepreneurship rates, which are computed by the number of start-ups divided by 1,000 employees in the region. Note that in both countries the creation of very small, micro businesses is not captured by the statistical offices. In the US, businesses without employees are not part of the SUSB and thus their creation is not counted as the birth of a new business. In the UK, registration for VAT is only compulsory if a business exceeds certain taxable turnover (in 2012 the threshold was £81,000), a limit smaller firms may not surpass. Thus, our measure of entrepreneurship also includes the creation of larger businesses, which are arguably more impactful in terms of job creation, innovation and economic growth [66]. Note also that such entrepreneurship rates (often called start-up rates) are commonly used to measure entrepreneurship [22, 67, 68] and are often regarded as superior to the rate of self-employment [69].

The choice of year for the entrepreneurship rates is governed by data availability. In the US, the most recent data allow the identification of the 2010 cohort of start-ups at the MSA level. In GB, we use the 2011 start-up data because many independent variables are only available from the Census, which was undertaken in 2011. On average the 2010 entrepreneurship rate in US MSAs is 4.2 start-ups per 1,000 employees with substantial regional variation (min = 2.1, max = 9.2, *SD* = 1.2). In GB, the 2011 entrepreneurship rate is 9.8 start-ups per 1,000 employees (min = 4.7, max = 22.5, *SD* = 2.9).

As a robustness check we considered an alternative measure of entrepreneurship that focuses on high-growth firms. This alternative measure addresses concerns that the start-up rate does not necessarily measure innovative Schumpeterian entrepreneurship [70]. In a recent article, Henrekson and Sanadaji [71] use the presence of Billionaire entrepreneurs from the Forbes *Magazine* as an indicator for Schumpeterian entrepreneurship in a cross-country setting. Unfortunately, this data set is not suitable for within country analyses because the Forbes Magazine lists only the actual residence of the Billionaire entrepreneurs but not the location of the entrepreneurial firms that made them rich. Nevertheless, we follow Henreckson and Sanadaji [71] approach of using an unambiguous measure of high-impact entrepreneurship, which in the present paper is based on a list of firms with exceptional growth.

In the US we draw on the 100 fastest growing firms listed by the *Fortune Magazine* in 2014 [72]. To qualify for consideration, firms must meet some criteria regarding revenue ($50 Million) and net income ($10 Million), listing on a US stock exchange and market capitalization ($250 Million), and growth in revenue and earnings per share (larger than 20%) over the last three years. Firms that meet these criteria are then ranked by growth rates for earnings per share, total return, and revenues.

In GB we use a comparable list of 100 fastest growing firms as published by the *Sunday Times* and *Virgin* for 2013 (Fast Track 100) [73]. Qualification criteria for this list comprise annual sales (£250,000) in the base year 2009/2010, annual sales (£5 Million) in 2012/2013, operating profits (£500,000) in 2012/2013, and employment (more than 10) in 2012/2013. The list excludes firms with higher initial sales then £500 Million. Additionally, firms in the technology sector are excluded because the *Sunday Times* ranks the fastest growing firms in the technology sector in a separate list. The qualifying firms are then ranked by sales in growth over a 3-year period.

There are certainly some differences in the listing approaches but firms on both lists definitely fit the criterion of exceptional growth. The lists, thus, make a usable sample of firms with the highest growth across a wide range of industries. For our analysis we locate the headquarters of the firms that allowed us to determine the region (MSAs in the US and LADS in GB). Of

the 100 fastest growing firms in the US, 86 were allocatable to an MSA. The remaining 14 firms are either not US based or have their headquarters in a rural area. In contrast to the US, all 100 fastest growing firms in GB were allocatable to an LAD. Both lists with regional allocation are available from the authors on request.

Entrepreneurial Culture (Entrepreneurial Personality Profile)

In recent years, very big data sets have established the existence of robust regional variation in psychological characteristics; for example, characteristics such as personality and values differ systematically across regions within countries and covary predictably with the economic, social, and institutional parameters of a region [18, 19]. Of particular relevance to the present work, spatial differences in the personality traits that comprise an entrepreneurial personality profile within the single individual have been identified, providing an empirical window onto geographic variation in entrepreneurial culture of regions [37].

These new large psychological datasets now provide the first major opportunity to subject the knowledge-culture interaction hypothesis to an empirical test, by determining the role entrepreneurial culture, and thus the macro-psychological make-up of regions, plays in shaping the impact of knowledge resources on the entrepreneurial activity of regions [18, 21, 22]. We link the region's entrepreneurial culture, assessed by means of data collected from the broad populace, to the region's entrepreneurial activity because most entrepreneurs are drawn from local areas and research has demonstrated that the attitudes of the broad populace are the right ones to assess to understand entrepreneurial culture [4].

We used two large independent personality datasets from the US (N = 935,858) and GB (N = 417,217) that collected individual-level data on the Big Five traits, which is the predominant model of personality in contemporary psychological science [74]. In the US, we used personality data collected within the Gosling-Potter-Internet-Project between 2003 and 2009 [19] (The IRB of the University of Texas at Austin: The study/approval number is: 2004-10-0073. A waiver of informed consent was provided because the study was deemed to minimal risk and no identifying information is collected. Thus it qualifies as an exempt study. The IRB approved this consent procedure #2004-10-0073).

In GB, we used personality data collected between 2009 and 2011 with a large Internet-based survey designed and administered in collaboration with the British Broadcasting Corporation (BBC) (The Psychology Research Ethics Committee of the University of Cambridge approved the research and procedure for obtaining consent in October 2007). Volunteers were told that the survey was designed to assess personality and that by clicking on the link to proceed to the survey they were giving their consent to participate. Informed consent was not requested from the next of kin, caretakers, or guardians on behalf of minors or children because only individuals 18 and older were eligible to participate. Initiating the survey was used as a record of participant consent. This study is part of the BBC LAB UK project (http://www.bbc.co.uk/labuk/), which is a public research project that follows strict ethical standards.

In both countries under study, the Big Five Inventory (BFI; [60]), which consists of 44 short statements designed to assess the prototypical traits defining each of the Five Factor Model dimensions, was used to assess personality. Using a 5-point Likert-type rating scale with endpoints at 1 (*Disagree strongly*) and 5 (*Agree strongly*), respondents indicated the extent to which they agreed with each statement. Analyses of the BFI scales revealed decent internal reliability (αs = .82, .76, .79, .79, and .77 in the US and αs = .86, .77, .83, .83, and .79 in GB, for Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness, respectively).

Following earlier research [37, 75], the entrepreneurial personality profile at the individual level is based on Cronbach and Gleser's [76] D^2 approach of quantifying the similarity

between two profiles. The individual match between a person's empirical Big Five profile and the fixed reference profile with the extreme scores in each Big Five dimensions, defining the outer limits of the single Big Five traits within an entrepreneurial personality structure (i.e., highest possible value in E, C, O; lowest possible value in A, N). In the first step, each person's squared differences between the reference values and their personal values on each of the five scales were computed. For instance, if a person scored 3 in neuroticism, the squared difference was 9 (because the reference value was 0). Second, the five squared differences were summed up for each person. Third, the algebraic sign of this sum was reversed (e.g., a value of 20 became -20). The resulting value served as the final variable of the entrepreneurial personality profile, which means that a higher value in this final score signals a stronger entrepreneurial personality structure. These individual scores on the profile were then aggregated to the regional level (average score) to achieve the regional value for the local *entrepreneurial culture*. This index of the entrepreneurial culture of regions had a mean of -20.29 (SD = 0.38) across the US regions, and of -20.79 (SD = 0.42) across the GB regions. As noted in Obschonka et al. [37], this index offers efficacy in empirical regional studies because it summarizes complex information on the single Big Five traits in one single index, which then is the basis for the aggregated measure of the local entrepreneurial culture. Nevertheless, while this fit measure is rich in information, it is still a relatively broad measure (e.g., it does not consider the individual shape of the empirical Big Five profile of a person but the general deviation from the fixed statistical reference profile). As such, it mirrors the heterogeneity of entrepreneurs and entrepreneurial activities in a given society as well as the broadness of the generally accepted definition of entrepreneurs and entrepreneurial activities in the contemporary entrepreneurship literature.

Knowledge Resources

The economics literature points to two key features of knowledge resources—human capital and industrial structure. Human capital–how extensively and effectively people invest in their own capacity to generate life-time earnings–represents a population's potential for productivity based on acquired higher education, job training, or other means of acquiring information. Such factors increase the ability of an individual to think critically, recognize and pursue new opportunities, and to develop new knowledge [77].

We measure *human capital* in the US with the share of the working-age population with a bachelor degree or above, e.g., [2]. Data on qualifications come from 2010 ACS 5yr estimates in the US. In GB, we measure human capital using the share of the working-age population in a region that has a Level-4 qualification or above according to the National Qualifications Framework [78]. A Level-4 qualification is equivalent to a certificate of higher education. The qualification data come from annual population survey in 2011 in GB. Such measures of human capital are widely used in regional economics and are robust predictors for entrepreneurship, e.g., [22, 79]. Beside human capital, seminal theories point to the key role of the regional *industrial structure* for regional economic growth. In particular, theories of agglomeration suggest that the industrial structure affects knowledge creation and innovation, e.g., [80–82]. One approach developed by Jacobs [83] emphasizes the benefits of a diverse industry structure for innovation. New knowledge is often just a recombination of existing knowledge pieces. Industries often rely on different knowledge stocks so a mix of industries in a region offers greater potential for knowledge spillovers and recombination than does a single-industry agglomeration in a region. Put differently, industrial diversity within a region increases the flow of ideas between different industries, fostering the creation of new knowledge through recombination of existing knowledge [3].

In measuring industry diversity, we follow prior research by using the inverse Hirschman-Hefindahl-Index (IHHI)

$$IHHI = \frac{1}{\sum_{i=1}^{N} s_i^2}$$

where s_i is the employment share in the i-th industry sector [84]. In both countries we rely on a broad industry classification scheme (1-digit level, e.g., information and communication industry, construction industry) excluding the agricultural sector and the public administration sector. Data regarding employment in industry sectors come from the 2010 ACS 5yr estimates in the US and the 2011 census in GB. The average IHHI is 7.2 (*SD* = 0.8) in US MSAs and 9.6 (*SD* = 0.7) in GB.

Control Variables

Beside knowledge and entrepreneurial culture, other regional characteristics can influence entrepreneurial activity. In the regressions, we rely on a standard set of control variables typically used in regional entrepreneurship research.

First, *unemployment* can have positive and negative effects on entrepreneurship. On one hand, unemployment can foster entrepreneurship to the extent that people opt for starting-up a new firm in order to earn a living. Thus, the higher the unemployment is in a region, the more unemployed people might become entrepreneurs. On the other hand, unemployment can be a signal for unfavorable economic conditions, which can dampen incentives for new firm formation [67, 85].

In our regressions, we use the absolute level and the change of the unemployment over time as predictors. This is measured in the US with the mean of the unemployment rate between 2006 and 2010 and the percentage change of the unemployment rate in the same time span. In the US, we use data from 2010 ACS 5yr estimates. Note that in 2006, data on unemployment for one MSA (New Orleans-Metairie-Kenner, LA) were missing. The missing value was replaced by interpolation based on long-run trends in this MSA. In GB we rely on data from the model-based estimates of unemployment provided by ONS between 2007 and 2011. The descriptive statistics reveal that the average unemployment rate between 2006 and 2010 across the US MSAs was 6.7, which increased by 109% (*SD* = 52.2) in this time span. The respective numbers for GB between 2007 and 2011 are 4.9 (*SD* = 1.2) with a comparable upwards trend (average increase of 58%, *SD* = 18.9). The drastic increase in unemployment reflects the impact of the 2008–2009 Great Recession from which regional economies did not recover until 2010/2011.

Second, occupational-choice models argue that people become entrepreneurs if they have higher utility or earnings than in paid employment. Accordingly, high or rising regional purchasing power should matter for entrepreneurship because it signals high or rising demand for products and services. Measures of income or GDP have been shown to be robust predictors for entrepreneurship, e.g., [67, 79, 86].

In our models we use the *absolute level of income* and *change of income over time* as control variables. In the US, we rely on per-capita income data from the US Bureau of Economic Analysis. We compute the mean of the per-capita income between 2006 and 2010 as well as the percentage change of per-capita income during this time. Between 2006 and 2010 US citizens earned on average $35,455 per year in the 366 MSAs (*SD* = $6,538). During that time span, income increased by 7.5% (*SD* = 6.0). In GB, we use the 2007–2011 data from the annual survey of hours and earnings, which reports hourly gross pay and the hours worked per week. Multiplying both variables yields the average weekly earnings. Note that in 6 LADs (Derbyshire Dales, Wealden, Braintree, Daventry, South Northhamptonshire and City of London) income

data for some years are not reported. These missing values were interpolated using long run trends in these LADs. Average weekly per capita income in GB LADs was £462 (*SD* = 75) in the years 2007–2011. Within the same time span, income increased by 7% (*SD* = 6.6).

Third, we considered *migration*. Many western societies face increased immigration with substantial economic consequences. Immigrants often face labor market discrimination [87], which can push them into entrepreneurship because they lack alternatives in paid employment. Additionally, a sizeable fraction of immigrants are skilled [88] which can—according to human capital theory—pull people into entrepreneurship. In our analyses we therefore included a control variable representing the regional share of immigrants.

Migration data for the US MSAs come from 2010 ACS 5yr estimates in the US. As a basic indicator for migration we use the percentage of the population who moved to the county from abroad in the year prior to the ACS survey. Using this definition, on average 0.6% of the population of an MSA recently immigrated from abroad (*SD* = 0.5). In GB, comparable questions regarding immigration were available for the Scottish 2011 census but not for the 2011 Census in England and Wales. Thus, we use data from the 2001 Census from which—as in the US—the percentage of immigrants in the year before the census can be computed. We are confident that migration destinations are relatively stable over time because migrants often choose destinations where other migrants already live. Using this data source, 0.5% of the population in the GB LADs recently migrated to the LAD from abroad (SD = 0.4).

Fourth, the *age group 25–44* was considered. Another important influence on regional entrepreneurship is the population's age structure [89]. It is well known that individual's tendency to engage in entrepreneurship is age dependent—reaching its peak in the period from the mid 20s to the early 40s [90–92]. People younger than 25 tend to lack skills from work experience and financial resources for entrepreneurship [93] while people older than 44 tend shy away from significant occupational changes [53, 94]. Following this logic we control for the share of the regional population aged 25–44.

Data on the age structure of the regional population stem from 2010 ACS 5yr estimates in the US and the 2011 Census in GB. In the 366 US MSAs the average population share of the 25–44 age group is 26% (*SD* = 2). We observe quite similar numbers in the GB LADs where the population share of the respective age group is 25% (*SD* = 3).

Fifth, we considered *population density and growth*. Population growth is used as a control because a growing population indicates growing demand for products and services, which might drive new entrepreneurial activity, e.g., [79]. Population density is used because it is an excellent control for the general economic prosperity of regions. It is highly correlated with many structural characteristics playing a role in regional entrepreneurship so entrepreneurship scholars regard it a catch-all variable that controls for a range of regional characteristics such as land prices, size of the labor market, and availability of infrastructure, e.g., [67, 16].

Data on the size of the population in regions come from the Census in the US and GB. Population growth is computed as the increase in population between 2000 and 2010 in the US in percent while we use the Census data in 2001 and 2011 in GB.

Finally, we controlled for patterns associated with *larger regions*. We use dummy variables indicating larger regions in both countries. In the US we include dummies for the set of MSAs in the West, Midwest and Northeast. In GB, we include dummies for LADs in England and Wales.

Results

Here we present the regression results computed separately in the two countries. The dependent variable is the entrepreneurship rate as defined as the number of start-ups per 1,000 employees in a region. All independent variables and control variables (with the exception of

the binary regional controls) were z-standardized to avoid multicollinearity. OLS-regression is the standard analytic method in regional entrepreneurship research, e.g., [26, 46–48, 67, 79, 95] so it is the primary method used here. The places (MSAs and LADs) differ in their population sizes resulting in fewer individual observations from less populated regions in the personality datasets. An unwelcome side effect of these size differences is that the average regional scores of the Big Five traits (from which we compute the entrepreneurial-culture indicator) are based on different number of participating individuals (see for details on this Section 1.2). Therefore, all regressions are weighted by the number of respondents per region in the personality data set; this procedure gives greater weight to regions with more observations and thus a more precise measurement of the regional traits [60].

Table 1 shows the main results from OLS regressions in US regions (Models 1–3) and GB regions (Models 4–6). The models have a high explanatory power by explaining more than

Table 1. Start-up rate, human capital, industry diversity, entrepreneurial culture, and interactions.

	Dependent variable: Entrepreneurship rate					
	US			GB		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Human capital	0.19*	0.14	0.18*	-0.24	-0.27	-0.16
	[0.16]	[0.12]	[0.15]	[-0.06]	[-0.07]	[-0.04]
	(0.08)	(0.08)	(0.08)	(0.17)	(0.16)	(0.16)
Industry diversity	0.34**	0.33**	0.21**	0.23	0.38**	0.25
	[0.32]	[0.32]	[0.20]	[0.05]	[0.08]	[0.05]
	(0.06)	(0.06)	(0.06)	(0.14)	(0.14)	(0.13)
Entrepreneurial culture	0.22**	0.20**	0.20**	0.92**	0.84**	0.90**
	[0.15]	[0.13]	[0.14]	[0.20]	[0.18]	[0.19]
	(0.06)	(0.06)	(0.06)	(0.16)	(0.16)	(0.15)
Interaction: Human capital X		0.11*			0.53**	
Entrepreneurial culture		[0.08]			[0.15]	
		(0.05)			(0.11)	
Interaction: Industry diversity X			0.19**			0.54**
Entrepreneurial culture			[0.18]			[0.13]
			(0.05)			(0.10)
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes
Constant	4.20**	4.18**	4.23**	9.15**	9.06**	8.94**
	(0.07)	(0.07)	(0.07)	(0.37)	(0.36)	(0.36)
Observations	366	366	366	375	375	375
Adjusted R2	0.630	0.634	0.646	0.846	0.855	0.858
F test	45.42**	43.08**	45.49**	159.2**	159.1**	162.6**
AIC	731.5	729	716	1477	1455	1448

The dependent variable is entrepreneurship rate, measured in # start-ups / 1,000 employees in a region. The independent variables are human capital, industry diversity and entrepreneurial culture based on personality data of current residence. Additional control variables include unemployment rate and its change over time, per capita income and its change over time, population density and growth, the share of recently migrated people, the population share of the age group 25–44 and geographic dummy variables (e.g., Region Midwest in the US and Wales in the GB). All variables are z-standardised. Models 1–3 report OLS regressions for the US and Models 4–6 for GB. OLS regressions are weighted by the number of observations per region in the personality data file giving more weight to regions with more observations and a more precise measurement of the entrepreneurial culture variable. Displaying unstandardized coefficients, standardised coefficients in brackets and standard errors in parentheses.

**,* = 1%, 5% significance level.

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60% of the regions' variation in entrepreneurship rates. All regressions are weighted by the number of respondents per region in the personality data set, cf., [4]. As shown in Model 1 for the US and Model 4 for GB, human capital had a significant main effect on entrepreneurship rates in the US (B = .19, β = .16, *P* = .016) but not in GB (B = -.24, β = -.06, *P* = .142). Also industry diversity had a positive main effect on entrepreneurship rates in the US (B = .34, β = .32, *P* = .000) but not in GB (B = .23, β = .05, *P* = .104). Entrepreneurial culture had a significant main effect on entrepreneurship rates in both countries (US: B = .22, β = .15, *P* = .000; GB: B = .92, β = .20, *P* = .000). In the next step we test for the hypothesized interaction effects. The interaction between the entrepreneurial culture and the knowledge-creation indexes (human capital: Model 2 for US and Model 5 for GB; industry diversity: Model 3 for US and Model 6 for GB) was significant in both countries (US human capital: B = .11, β = .08, *P* = .038; US industry diversity: B = .19, β = .18, *P* = .000; GB human capital: B = .53, β = .15, *P* = .000; GB industry diversity: B = .54, β = .13, *P* = .000). Consistent with predictions, in both countries the local entrepreneurship rate was highest when high human capital came together with an entrepreneurial culture (Fig 1) and when high industrial diversity came together with an entrepreneurial culture (Fig 2). In fact, the positive effects of human capital and industry diversity are substantially weaker or even vanish in regions where the entrepreneurial culture is weak.

Fig 3 (US) and 4 (GB) compare maps of the entrepreneurship rates (Figs 3A and 4A), of the interaction between human capital and entrepreneurial culture (Figs 3B and 4B), and of the interaction between industry diversity and entrepreneurial culture (Figs 3C and 4C). In both countries regions with a high/high pattern (high knowledge and high entrepreneurial culture) enjoy comparatively higher entrepreneurship rates. In the US these are regions in Florida, along the Pacific Coast and the Rocky Mountain Regions. The wealthiest region in the US, San Jose–home of Silicon Valley, not only exhibits relatively high entrepreneurship rates but also high levels in both knowledge (human capital, industry diversity) and entrepreneurial culture. In GB the picture is somewhat more nuanced, but London and regions in the South East stand out. In contrast, regions in the US and GB with a combination of low knowledge and a low entrepreneurial culture exhibit low entrepreneurship rates (e.g., many regions in the South and Midwest regions in the US and many regions in Wales, Scotland and the East of England).

Our results show that regions in the US with high levels of knowledge (1 *SD* above mean in human capital and industry diversity) and a high entrepreneurial culture (1 *SD* above mean) have an entrepreneurship rate (startup rate), which is on average 18% higher than in comparable regions with high levels of knowledge but a low entrepreneurial culture (1 *SD* below mean). In GB these differences are even more pronounced. Regions in GB with high levels of knowledge and high entrepreneurial culture have on average a 35% higher entrepreneurship rate compared to regions with high levels of knowledge but low entrepreneurial culture.

We conducted a series of nine robustness checks that consider a) alternative personality-based measures of the local culture, b) alternative spatial levels, c) migration patterns, d) representativeness issues regarding age and gender, and e) alternative explanations of the findings (e.g., whether the region's employment share in creative occupations confounds our results, [96]). The additional results are presented and discussed in the Supporting Information Appendix (Section 2, Tables A5-A21 in S1 Information). Taken together, these additional tests provide a remarkably consistent picture that supports the statistical validity and robustness of our main findings (i.e., the interaction between knowledge and entrepreneurial culture in the prediction of regional entrepreneurship rates).

Although the start-up rate is a widely used and accepted indicator for general entrepreneurial activity [21, 68]. An alternative measure focuses on high-impact firms [70], which has generally been measured as enterprises with exceptional growth [97]. For example, Henreckson

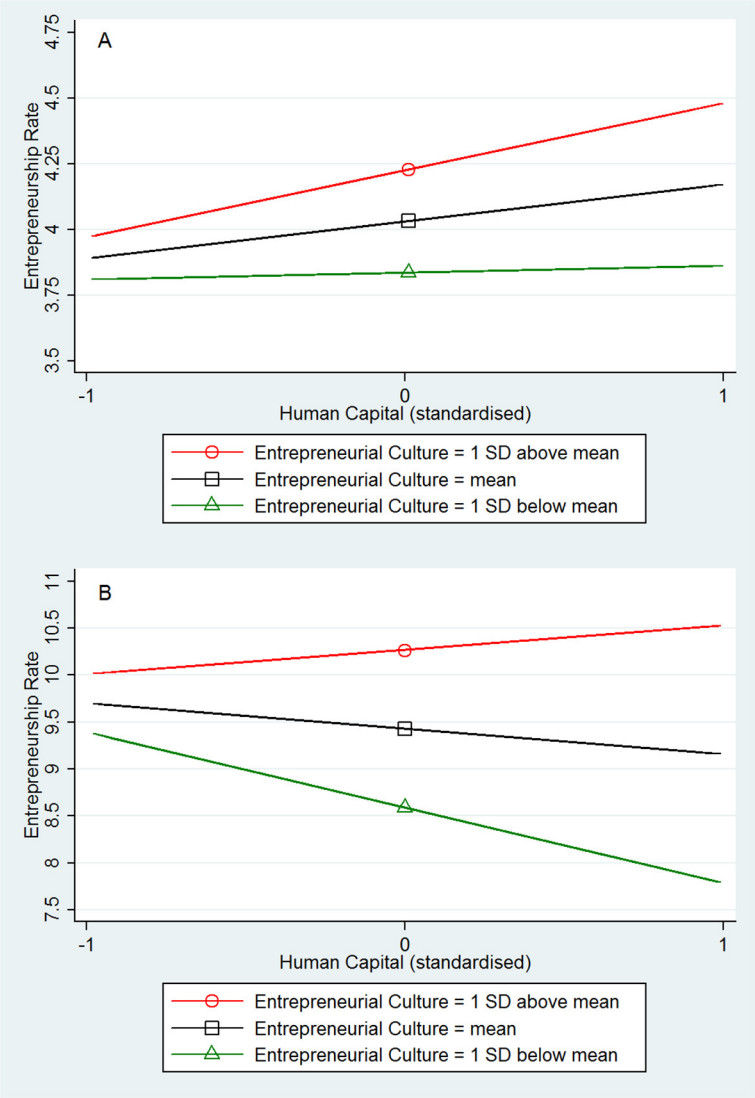

Fig 1. Interaction plots from OLS regression: Human capital X Entrepreneurial culture. (A) Fig 1A (top): US, N = 366. (B) Fig 1B (bottom): GB, N = 375.

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and Sanandaji [71] use the presence of billionaire entrepreneurs in a cross-country analysis of entrepreneurial activity. For our within-country analyses we use a conceptually related measure: the 100 fastest-growing US firms as listed by *Fortune Magazine* [72] and a comparable list of 100 firms with the fastest growth published by the *Sunday Times* and *Virgin* for GB (Fast Track 100). More than 75% of the US-based Fortune 100 firms and 66% of the GB-based Fast Track 100 firms are located in regions with above-median levels for both of the measures of knowledge and entrepreneurial culture. In contrast, less than 5% of the Fortune 100 and less than 15% of the Fast Track 100 firms are from regions with below median levels for both the measures of knowledge and entrepreneurial culture.

At least one Fortune 100 firm was located in around 22% of the regions exhibiting measures of knowledge and culture above the median. By contrast, at least one Fortune 100 firm was

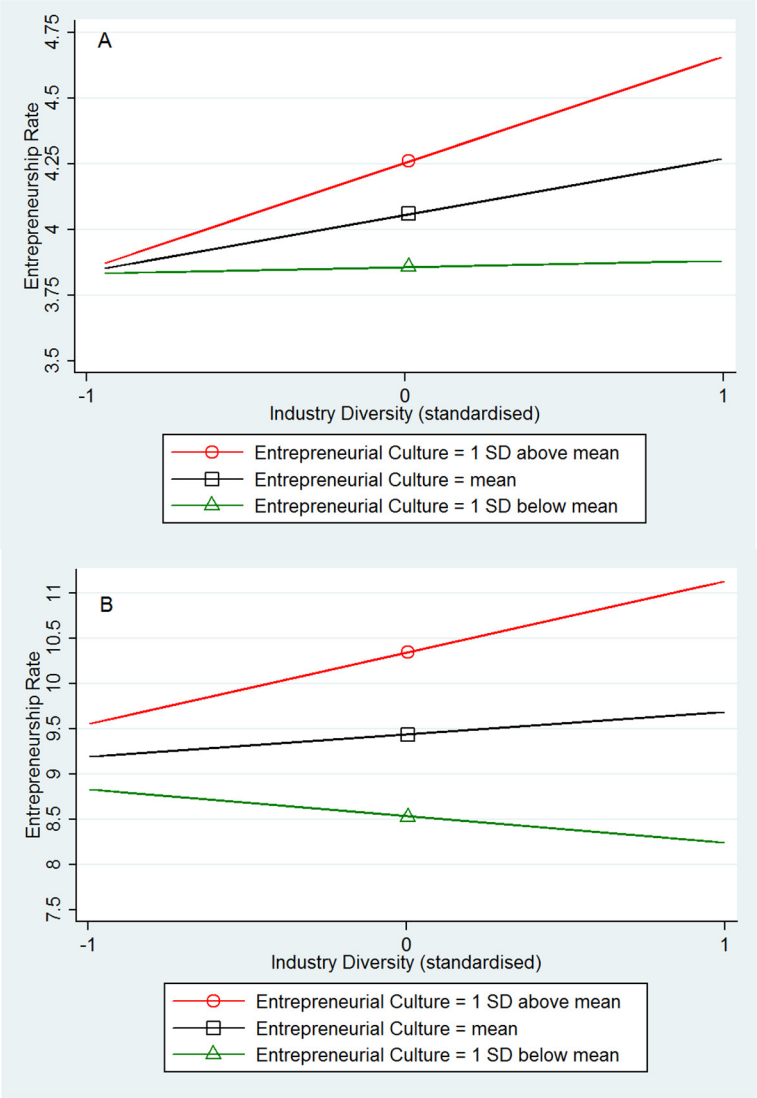

Fig 2. Interaction plots from OLS regression: Industry diversity X Entrepreneurial culture. (A) Fig 2A (top): US, N = 366. (B) Fig 2B (bottom): GB, N = 375.

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located in fewer than 4% of the regions exhibiting measures of knowledge and culture below the median (Section 2, Tables A18 and A19 in S1 Information). Chi2-tests confirm the statistical significance of this difference ($\chi^2 = 32.5$, $p < 0.001$ for human capital and culture, $\chi^2 = 22.0$, $p < 0.001$ for industry diversity and culture). A similar pattern was observed for the data from GB (Section 2, Tables A20 and A21 in S1 Information). At least one Fast Track 100 firm was located in around 20% of the regions exhibiting high measures of knowledge and culture. By contrast, this held for fewer than 10% of the regions exhibiting low levels of knowledge and culture. Again this difference is statistically significant ($\chi^2 = 7.6$, $p < 0.05$ for human capital and culture, $\chi^2 = 7.9$, $p < 0.05$ for industry diversity and culture). These additional analyses of firms with exceptional growth underscore the statistical robustness of the knowledge-culture interaction effect, even when considering an alternative measure of entrepreneurship.

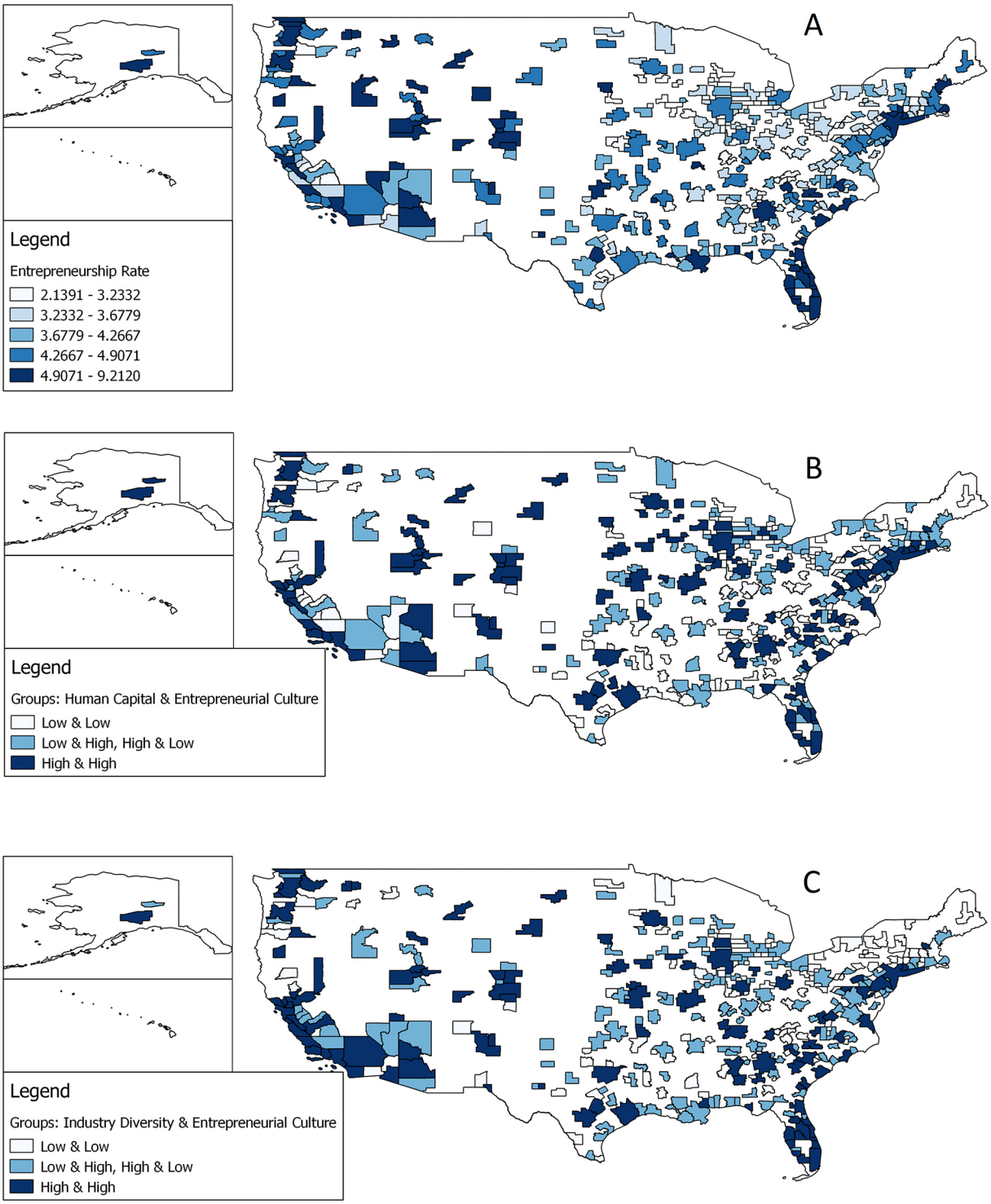

Fig 3. Maps of entrepreneurship rates and the interaction between human capital, industry diversity, and entrepreneurial culture of US regions (N = 366). (A)Fig 3A (top): Entrepreneurship rate in US regions. (B) Fig 3B (middle): Interaction groups between human capital and entrepreneurial culture in US regions. (C) Fig 3C (bottom): Interaction groups between industry diversity and entrepreneurial culture in US regions. Fig 3B should be interpreted as follows: Both variables, human capital and the entrepreneurial culture were splitted at the median. Regions in bright have below median values in human capital and the entrepreneurial culture. Regions in light blue are above median in either human capital or the entrepreneurial culture. Regions in dark blue have above the median values in human capital and entrepreneurial culture. Fig 3C is interpreted in the same way as Fig 3B while interaction groups are created for the variables industry diversity and entrepreneurial culture. The shapefile underlying these maps was kindly provided US Census geography. It contains Ordnance Survey data.

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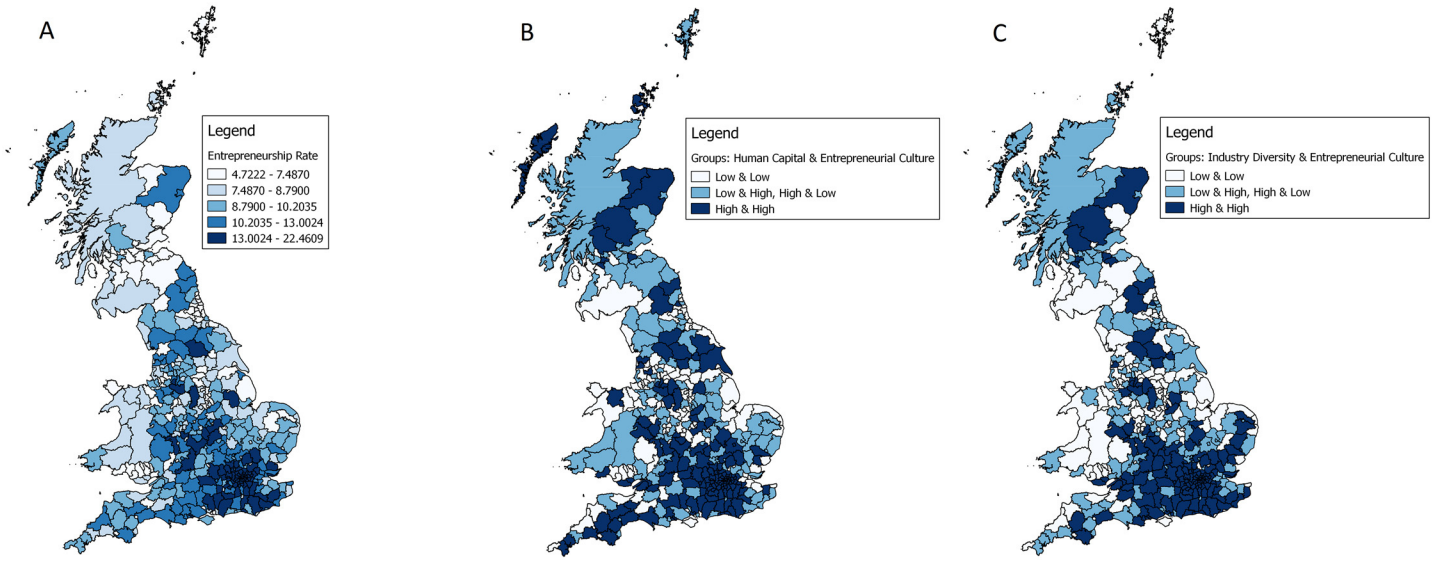

Fig 4. Maps of entrepreneurship rates and the interaction between human capital, industry diversity, and entrepreneurial culture of GB regions (N = 375). (A) Fig 4A (left): Entrepreneurship rate in GB regions. (B) Fig 4B (middle): Interaction groups between human capital and entrepreneurial culture in GB regions. (C) Fig 4C (right): Interaction groups between industry diversity and entrepreneurial culture in GB regions. Fig 4B should be interpreted as follows: Both variables, human capital and the entrepreneurial culture were splitted at the median. Regions in bright have below median values in human capital and the entrepreneurial culture. Regions in light blue are above median in either human capital or the entrepreneurial culture. Regions in dark blue have above the median values in human capital and entrepreneurial culture. Fig 4C is interpreted in the same way as Fig 4B while interaction groups are created for the variables industry diversity and entrepreneurial culture. The shapefile underlying these maps was kindly provided ONS Geography. It contains Ordnance Survey data: Crown copyright and database right 2015.

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Discussion

Our analyses, which were undertaken in two independent samples (in the US and GB), attempted to bridge the two disparate disciplines of economics and psychology by testing the statistical interaction between knowledge and culture in regional entrepreneurship rates. Our correlational data do not permit causal conclusions but they nonetheless revealed a robust and consistent statistical interaction, one which is consistent with theory and research on the psychological characteristics of entrepreneurs. Moreover, the effect survived a wide variety of robustness checks. Hence, even these correlational results can provide candidates to be tested in future research.

Our results have several limitations. First, they are based on correlational data and cannot deliver strictly causal evidence. Second, we investigate only two knowledge resources, human capital and diversity of industries, and future studies could consider other measures of knowledge creation (e.g., investment in R&D, the prevalence of product and service innovations). Third, our study investigates two Western innovation-driven economies. It is unclear whether our results also apply to other economies that are not primarily innovation-driven.

To conclude, future research should continue to integrate "hidden" cultural aspects into economic models of regional performance. We hypothesize that neither knowledge creation nor the local culture alone are responsible for the entrepreneurial vitality, and subsequent economic prosperity, of a region. Rather, the success of a region in the contemporary globalized, innovation-driven economy may depend on the interplay between culture and knowledge creation. If the interaction effect survives causal tests, it would offer a new explanation for the "knowledge paradox" in economics [16]. We further hypothesize that this culture-based

perspective implies that a substantial amount of existing new knowledge–the potential for economic prosperity–in regions with lower levels of entrepreneurial culture may remain unexploited. If so, then an entrepreneurial culture might be regarded as a boundary condition for the relationship between knowledge and entrepreneurship.

Supporting Information

S1 Information. Entrepreneurial regions: Do macro-psychological cultural characteristics of regions help solve the "knowledge paradox" of economics?
(DOCX)

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Author Contributions

Conceived and designed the experiments: SDG PJR JP. Performed the experiments: SDG PJR JP. Analyzed the data: MO MS. Contributed reagents/materials/analysis tools: MS MO DBA MEL. Wrote the paper: MO MS SDG PJR DBA.

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S1 Supporting Information: Entrepreneurial regions: Do macro-psychological cultural characteristics of regions help solve the "knowledge paradox" of economics?

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1. Materials and Methods

1.1. Regions

For the analyses in the United States (US), Metropolitan Statistical Areas (MSAs) are utilized as the fundamental spatial unit. MSAs are defined by the U.S. Office of Management and Budget as urbanized areas with a population of 50,000 inhabitants or above. Typically an MSA consists of a central county with a high urban population share. Additional adjacent counties are included in the MSAs if they have substantial interaction with the central county

measured by commuting flows. Note that using MSAs as a key spatial unit is standard practice in regional entrepreneurship research, e.g., [1,2]. There were 366 metropolitan statistical areas in the US (excluding Puerto Rico) at the end of December 2009.

In Great Britain (GB) there is no officially defined equivalent of MSAs. The closest match to the US definition of MSAs are UK travel-to-work areas, TTWAs [3]. Like in the US, TTWAs are constructed using commuting flows. Unfortunately, the UK National Statistical Office provides only a very limited set of data at the TTWA level. For this reason, we use Local Authority Districts (LADs) as the fundamental spatial unit for the analyses in GB. LADs are administrative units with a substantial degree of local government. LADs are the most fine-grained spatial unit for which entrepreneurship data are reported in GB and have been previously used in entrepreneurship studies, e.g., [4]. Due to missing data for some of our independent variables we excluded the Northern Ireland LADs and the Isle of Scilly from the sample. Additionally, we aggregated all Metropolitan Boroughs (also officially listed as LADs) that form the Greater London region by averaging the values of the variables in the Boroughs . With these adjustments, there were 375 LADs in GB.

It is important to stress these differences in the spatial level between both countries. In the US, we use MSAs which typically consist of several counties with a high degree of integration that together form a "functional region" or city. In contrast, in GB we rely on a set of administrative regions with considerable variation in terms of size and character (urban vs. non-urban). However, in a robustness check (see Section 2 below) we were able bridge the gap in the spatial unit by utilizing a smaller set of 56 English cities for which a best-fit lookup file allocating LADs to TTWAs was available from a UK based research group [5].

1.2. Psychological datasets

The measures for the entrepreneurial culture of regions in the US and GB are based on psychological traits of residential populations living in these regions. This section describes the datasets containing the personality trait data and explains the computational procedures for generating the entrepreneurial culture index.

US

Personality data on US residents were collected in the Gosling-Potter-Internet-Project [6]. The data were collected via a noncommercial Internet webpage, which can be reached via several channels (e.g., search enginges, unsolicited links on other webpages). US residents can voluntarily participate in this study by completing a questionnaire on socio-demographic variables, personality traits, and state of residence. As an incentive participants received a personality evaluation based on their responses. For this research we utilize data collected between 2003 (the first time respondents were asked to provide their postal code) and 2009.

One of the primary aims of the current investigation was to compute an indicator of an entrepreneurial culture, so we included only those participants who reported living in the US (excluding Puerto Rico), who had completed the questionnaire section on the Big Five traits, which we use to compute this indicator, and who were allocatable to an MSA by ZIP code in the US. This selection criterion resulted in a total sample of 935,858 respondents (63% female). The respondents' mean age was 26 years (SD = 11 years). Regarding race, of those who indicated, 1% were American Indian and Alaska Native, 6% were Asian, 9% were Black, 0.5% Native Hawaiian and other Pacific Islanders, 75% where White and 8% had a different race. 76% of the respondents had a bachelor degree or higher.

Participants reported the ZIP code in which they lived at the time of survey completion. This information was used to determine the county of the respondents. There is no one-to-one link between the ZIP code and administrative regions because ZIP codes are a

postal code system and often cross county boundaries. This problem is less severe at the MSA level because roughly 85% of the relevant ZIP codes can be unambigioulsy allocated to either one of the 366 MSAs or to the residual non-urban area. The few ambigious multi-MSA ZIP codes were allocated to the MSA with the higher population. In case of a ZIP code belonging partly to an MSA and non-urban area, the ZIP code was allocated to the respective MSA. The MSA sample sizes ranged between 151 participants from Elmira (NY) and 46,205 participants from New York-Northern New Jersey-Long Island (NY-NJ-PA) (mean = 2,557; median = 1,025).

Then next step consisted of evaluating the representativeness of the Personality sample by comparing the demographic characteristics of the Personality sample with data from the American Community Survey (2010 ACS 5yr estimates) and 2010 Census data at the MSA level. In most cases, we correlated the percentage of respondents in each demographic group from the Personality sample with the percentage of the population from that group within 6each MSA. The correlation between the number of respondents per MSA and the population of the MSA was 0.97. More populated MSAs have more respondents in the Personality data set showing that regions were not systematically over- or underrepresented. The correlation between the share of female respondents and female population share at the MSA level is 0.27. With regard to age, the correlations of the population share in specific age groups at the regional level are 0.12 (under 18 years), 0.72 (18-24 years), 0.34 (25-44 years), 0.43 (45-64 years) and 0.40 (over 65 years). Regarding ethnicity, the correlations for American Indian and Alaska Native, Asian, Black, Native Hawaiian and other Pacific Islanders, and White were 0.93, 0.95, 0.94, 0.97 and 0.91. The correlation between the respondent share with a bachelor degree or higher and the respective population share in the MSA is 0.41. Overall, these results suggest that the Personality sample is fairly representative of the local population regarding ethnicity, education and employment. However, the deviation in some age brackets and the gender imbalance might be a concern. We address this concern in Section 2.1 with a

robustness check where we weight the individual respondents in the personality data set – which are used for the computation of the entrepreneurial culture indicator – by age and gender. The results of this robustness check did not differ from our main regressions.

GB

Analyses of GB regions were based on data from a large Internet-based survey designed and administered in collaboration with the British Broadcasting Corporation (BBC). Between November 2009 and April 2011, 588,014 individuals completed the "Big Personality Test" which consisted of eight sections covering demographics, education and work, personal relationships, personality and aspirations, health, and childhood experiences. For the present investigation, our analyses focused only on the personality measure.

The survey was advertised and promoted through various BBC websites, radio programs, and television shows. To complete the survey, respondents clicked on a link on the BBC's *Lab UK* website. Before proceeding, respondents were asked to obtain a BBC ID if they did not already have one. This was used to invite participants to take part in future projects and was also used to prevent individuals from repeat responding (the survey could not be completed more than once with the same ID). After completing the survey, participants received customized feedback about their personalities based on their responses to the survey items.

We included only those participants who reported living in England, Wales, or Scotland, and, replicating the procedure used for US Personality sample, we included only those who had completed the questionnaire section on the Big Five traits and were allocatable to LADs in GB. This selection criterion resulted in a total sample of 417,217 respondents (64% female). The mean age of respondents was 36 years (SD = 14 years). Of those who indicated, 4% were Asian, 1% were Black, 2% were of mixed ethnicity, 90% were White and

1% indicated “Other.” In terms of employment and education, 4% of the participants were unemployed and 45% reported completing an undergraduate or postgraduate degree.

Participants reported the postcode and the city or region in which they lived at the time in which they completed the survey. To preserve the anonymity of participants, the BBC made available only the postcode sector (i.e., the complete postcode prefix up to the first letter of the postcode suffix). The postcode information was primarily used to determine the Local Authority District (LAD) in which participants lived. We used the 2008 LAD codes, which included 375 districts across England (aggregating the London Boroughs and excluding The Isles of Scilly), Wales, and Scotland. In cases where no postcode information was available we used data on the city or region in which the participants resided to allocate the respondents to LADs. The LAD sample sizes ranged between 76 participants from Teesdale and 59,733 participants from London (mean = 1,113; median = 777).

To evaluate the representativeness of the samples for the LADs, we compared the demographic characteristics of the LAD samples with 2011 LAD data from the Office of National Statistics and the Scottish Neighbourhood Statistics. The correlation between the number of respondents in a LAD and the population of the LAD is 0.99, indicating that no LAD was over or under-represented in the data. The correlation between the regional share of female participants in the Personality sample with the regional share of the female population is 0.19. Regarding age, the correlations for the age groups are 0.02 (under 18 years), 0.64 (18-24), 0.73 (25-44) 0.74 (45-64) and 0.73 (over 64). With regard to ethnicity, the correlations for Asian, Black, Mixed, and White ethnicities are 0.92, 0.85, 0.74, and .92, respectively. The correlation between unemployment of the Personality respondents and the ONS data is 0.53. For education, the correlation is 0.70. Taken together, these results suggest that the LAD samples are fairly representative of the local population regarding ethnicity, education and employment. As in the US, there are deviation in some age brackets and the gender composition, which might be a concern. We address this concern with a robustness check

weighting the individual respondents in the Personality data set by age and gender. As in the US case, the robustness check did not yield different results then the main regressions (see Section 2.1).

1.3. Economic data

Detailed information about the sources and measurement procedures for the economic variables are presented in the main paper. Note that we use a comparable set of variables in both countries to achieve comparable results in both countries. Descriptive statistics and correlations for all variables are depicted in Tables A1 (US) and A2 (GB) in S1 Supporting Information.

2. Regression Analyses and Robustness Checks

2.1 Regression analysis

Table A3 in S1 Supporting Information replicates the results from Table 1 in the Main paper with all control variables displayed. Regarding controls (Model 1 for the US and Model 4 for GB), the change of the unemployment rate is positively correlated with entrepreneurship in the US. This suggests that higher unemployment can push people into entrepreneurship to earn a living. Per capita income is positively related to entrepreneurship rates in GB which can be interpreted as people reacting to signals of rising demand for products and services. Regions with a high share of immigrants have higher entrepreneurship rates in the US which is consistent with both the push and pull explanation why migrants opt for entrepreneurship than paid employment. Contradictory to our expectation, a high population share of the 25-44

age group predicts lower entrepreneurship rates in both the US and GB. Regions with a high population density and population growth enjoy higher entrepreneurship rates in both countries. Regarding our main independent variables, human capital and industry diversity had a positive main effect on entrepreneurship rates in the US but not in GB. Our measure of an entrepreneurial culture is positively related to entrepreneurship rates in the US and GB, suggesting that cultural factors indeed are an important driver of regional entrepreneurship.

In Model 2 (US) and Model 5 (GB) we introduce the interaction term between human capital and entrepreneurial culture into our model. In both countries, the interaction term is positive and significant. The second interaction term between industry diversity and entrepreneurial culture is introduced in Model 3 (US) and Model 6 (GB). Again, we find a positive and significant interaction effect in both countries. As discussed in great detail in the main text, this supports our knowledge-culture interaction hypothesis. Regional entrepreneurship rates are higher when high human capital as well as a high industry diversity come together with a high entrepreneurial culture in the region.

Our regression analysis is weighted by the number of respondents per region in the Personality data set in order to minimize the impact of the small sample sizes in measuring entrepreneurial culture. Table A4 in S1 Supporting Information also presents the results of the unweighted regressions. Of the four interaction terms between knowledge and entrepreneurial culture, three remain positive and statistically significant with the only exception being the interaction between human capital and culture in the US sample.

2.2 Robustness checks

We conducted several robustness checks. First, to check whether the results might be affected by the D^2 – profile similarity method [7] of assessing the individual entrepreneurial personality profile, we used a simple composite score by adding the mean scores for E, C and

O and then subtracting mean scores of A and N for each individual. These individual scores where then again aggregated at the regional level. Re-estimating regressions with this alternative measure of the region's entrepreneurial culture confirms the majority of the central effects (e.g., the interaction effects). These additional results are depicted in Table A5 in S1 Supporting Information.

Second, following earlier research on personality-based measures of entrepreneurial culture [8], we tested the entrepreneurial personality profile against two "neutral" profiles. In contrast to the entrepreneurial personality profile, these neutral profiles should yield non-meaningful results because there is no underlying theory speaking for an effect of such neutral profiles in our models. The first neutral profile was computed as a neutral D^2 profile building on each individual's D^2 deviation from the *middle values of the Big Five Likert scales* (how strong a person's empirical Big Five profile deviates from a fixed reference profile characterized by the simple middle values of the Big Five scales (e.g., a scale between 1 and 5 has a middle value of 3). The results, which are displayed in Table A6 in S1 Supporting Information, show that this neutral profile indeed yields non-meaningful results. The coefficient of the neutral profile is not significant and the coefficients for the interactions between the neutral profile and the knowledge-creation indexes are either not significant or have another than expected direction. We also used a second version of the neutral profile, which utilizes the *mean values* of the empirical distribution of the Big Five traits as fixed reference values. The second neutral profile then represents each individual's difference from the average *empirical* Big Five scores of the whole sample in each country (and not from the scale middle values like in the other "neutral" profile). These results are displayed in Table A7 in S1 Supporting Information. Again this neutral profile failed to deliver meaningful results. Consistent with prior research [8], these robustness checks testing "neutral" profiles support the validity of the entrepreneurial personality profile as a measure of the local entrepreneurial culture.

Third, to ensure that it is indeed the profile as a whole that is driving the effects, and not the single personality dimensions, we repeated our analyses testing the effects of the single Big Five personality dimensions instead of the profile. The individual traits indeed failed to yield consistent findings (see Table A8 in S1 Supporting Information), which again concurs with prior research [8]. Hence, it is indeed the configural constellation of personality traits that give the entrepreneurial profile its value.

Fourth, the US and GB regressions are based on a somewhat different spatial level. In the US we used MSAs, which typically consist of several counties with a high degree of socio-economic integration that combine to a city. In contrast, in GB we relied on a set of administrative regions that vary considerably in size and character (e.g., urban vs. non-urban). This difference in the spatial level is because no officially defined list of cities exists in GB and thus no economic data are available at such a spatial level. However, in a robustness check we were able to bridge the gap in the spatial level by utilizing a smaller set of 56 English cities for which data could be constructed (more details in Section 1.1). Running regressions on this set of English cities replicated the significant interaction between the knowledge-creation indexes and entrepreneurial culture (see Table A9 in S1 Supporting Information).

Fifth, an alternative explanation for the relevance of a region's entrepreneurial culture for entrepreneurship rates is that people with an entrepreneurial constellation of traits may move to a region with high start-up rates to take advantage of favorable business conditions to start their business. If one had access to the personality traits of the same respondents before they made any occupational-related migration choices then this selective-migration explanation could be ruled out by showing that the entrepreneurial culture measure still predicts entrepreneurship rates. We lacked longitudinal data on the participants but we did have information on where respondents lived when they were young. We therefore repeated the analyses but this time based on respondents' youth residence instead of their current

residence – the entrepreneurial culture measure of a certain region was assessed by aggregating the individual scores in the entrepreneurial personality profile from those respondents that grew up in this region (irrespectively where they currently live). The results showed again a significant main effect of entrepreneurial culture and significant interaction effects with the knowledge-creation indexes (Table A10 in S1 Supporting Information), which support the initial interpretation of the results.

Sixth, another alternative explanation for the results might be that the interaction between the entrepreneurial culture and knowledge is driven by the share of actual entrepreneurs in the region and not by a prevalent local entrepreneurial culture. In other words, a region could have a high entrepreneurship profile score purely because a lot of entrepreneurs live there and not because the region has an entrepreneurial culture more broadly. However, when we repeated the analyses in GB excluding current entrepreneurs from the sample, the interaction effects were replicated (see Table A11 in S1 Supporting Information; note, occupation information was not available in the US dataset). These analyses support the idea that a region's entrepreneurial culture is in the "air" rather than bound to the enterprising individuals.

The seventh robustness check extends the idea of the sixth robustness check – capturing the part of entrepreneurial culture that is in the air rather than bound to enterprising individuals – to occupations. Research suggests that personality traits affect occupational decisions (e.g., working in a coal mine vs. being a creative consultant) and that these occupations have specific characteristics such as low capital requirements and low minimum efficient firm sizes that influence individuals decision to be entrepreneurs or work as paid employees in these occupations [9]. To the degree that some occupations share work requirements with entrepreneurship (e.g., taking risks and being creative) the personality profiles of paid employees in certain occupations might be similar to those of entrepreneurs. If additionally these occupations spatially cluster, our observed correlation the culture score

and entrepreneurship rates could be driven by the unobserved prevalence of these occupations in the region.

To dispel these concerns, we additionally control for the employment share in creative occupations which should have lower entry barriers for entrepreneurship and similarities in work requirements with entrepreneurship. In the US, the occupation data came from the Bureau of Labor Statistics. We created six different versions of the employment share in creative occupations. The first three are based on the coding of Florida's [10] for the occupations belonging to the super creative core, the creative professionals and the sum of both henceforth referred to as creative class. The next three are based on an adapted list of occupations of these groups. This adaptation was suggested by McGranahan and Wojan [11] and tries to correct for the fact that some of the original occupations demanded less creativity than those originally thought included in the category. We included these regional employment shares in creative occupations separately into our regression model. To match the time dimensions of many other explanatory variables, we used the average of the 2006-2010 employment shares in the creative occupations. The results are displayed in Table A12 in S1 Supporting Information. Model 1 shows the results of our original regression (Main paper Table 1). Models 2-7 include the different versions of the employment shares in creative occupations. It is evident from these results that the coefficient of the entrepreneurial-culture variable remains significant and does not differ much in size compared to Model 1. This result suggests that the presence of creative occupations (with higher entrepreneurship tendencies) does not drive the relationship between entrepreneurial culture and entrepreneurship rates. Interestingly, the coefficient for the employment shares in creative occupations is negative (and in many cases even significant). The reason for this counterintuitive result is not because there is a negative relationship between creative occupations and entrepreneurial activity. The bivariate correlations of the 6 employment shares in creative occupations with the entrepreneurship rate ranges from +0.02 to +0.32.

However there is a very high correlation between the employment shares in creative occupations and our human capital indicator (ranging from +0.51 to +0.73). This is because conceptually and empirically there is a close relationship between human capital and creativity (in the sense described by Florida [10]). Looking back at the examples of creative occupations in the preceding paragraphs reveals that all of them require extensive schooling. The high correlation between creative-class measures and human capital leads to multicollinearity problems in our regression – raising the Variance-inflation factor from 4.5 to above 6. This problem has been also identified by others, e.g., [12] and plagues research in this area.

The multicollinearity problem would be amplified if we additionally included the interaction terms between human capital and the entrepreneurial-personality profile in the regressions. This is because the interaction term is a product of the standardized raw variables and thus contains a lot of characteristics from the original human-capital variable. As a result, coefficient estimates can vary greatly if the regression model is slightly changed. Results of such models should thus be interpreted with great care. Nevertheless we ran these models whose results are displayed in Table A13 in S1 Supporting Information. Model 1 again is a replicate of the Model 1 in Table 1, while Models 2-7 additionally include the employment share in creative class occupations. We find that in most cases the coefficient of the interaction term between human capital and entrepreneurial culture remains positive and is still significant at the 5% or at the 10% level. Note that the interaction between industry diversity and entrepreneurial culture remains completely unchanged when controlling for creative class occupations. Thus we do not report these results here.

The above apparent problems in controlling for occupation-specific characteristics at the regional level can be bypassed in an additional GB analysis. The GB personality data set includes individual level information on personality traits, occupation, and entrepreneurial status (the information on entrepreneurial status is not available in the US personality data set)

and thus offers the possibility of conducting such a robustness check at the individual level. Specifically, respondents were asked to select an occupational category (out of 23 possible categories) that best describes their occupation. As expected, there are pronounced differences in the tendency of being an entrepreneur across the different occupations (see Table A14 in S1 Supporting Information for an overview). Furthermore there is a moderate negative correlation (r = -0.26) between the average tendency of being an entrepreneur and the difference between the average entrepreneurial personality profile of the entrepreneur and the average entrepreneurial personality profile of employees across occupations. In other words in occupations with a high entrepreneurial tendency, the personality profile of the self-employed and those in paid employment differ less.

In this robustness check we rely on a subset of the respondents in the personality data set. As we are interested in whether a respondent is an entrepreneur versus a paid employee, we excluded respondents not active at the labour market (e.g., those who were still at school or university, already retired). We additionally excluded a small amount of cases (n=26,295) with missing data on the other key control variables (e.g., ethnicity, gender, education). This results in a sample of 247,232 individuals. Our dependent variable takes the value of 1 if the respondent is self-employed and 0 if the respondent is in paid employment. The key independent variable at the individual level is the entrepreneurial personality profile of the respondent, which is computed as described in the Main paper and in Obschonka et al. [8]. At the individual level, we control for age, gender, income (7 categories), ethnicity (White, Asian, Mixed, Black), and education (dummy variable; 1=respondent has an undergraduate or postgraduate degree, 0=otherwise).

The results of a standard logistic regression are displayed in Table A15 in S1 Supporting Information. Model 1 reports results without the 22 occupational dummy variables. The results suggest that the individual entrepreneurial personality profile is indeed associated with individual entrepreneurship. Those with a higher entrepreneurial personality

profile have a higher likelihood to be an entrepreneur. Model 2 includes the 22 dummy variables for the above displayed occupations (the reference category is other occupations). These dummy variables capture all occupation-specific characteristics that can influence individual entrepreneurship and their inclusion sheds light whether the relationship between the individual personality traits weakens once occupation is controlled for. While all coefficients for the occupational dummies are significantly related to the entrepreneurship status, the size of the coefficient of the individual entrepreneurial personality profile drops only slightly. This result suggests that personality matters even after taking occupational characteristics into account.

In the next step we included the regional-level variables, which we use throughout the paper in our regional level regression, in the model. This analysis provides the opportunity to test whether the regional entrepreneurship culture measure is associated with individual entrepreneurship even after taking individual variation in personality into account. Recall that the entrepreneurial-culture measure of a region is simply the average of the individual entrepreneurial-personality profiles of all respondents living in the specific region. Such a test is important for two reasons. Firstly, as we argue in the paper, entrepreneurial culture is fundamentally a collective construct. If our cultural measure explains variation in individual entrepreneurship over and above the individual entrepreneurial personality profile, it strengthens our argumentation of the collective nature of our indicator of entrepreneurial culture. Secondly, entrepreneurship needs human agency. It is individuals and not regions who start businesses. Conducting regressions at the individual level with regional-level predictors considerably weakens the risk of falling prey to the ecological fallacy. Model 3 displays the results after including the regional-level variables. The regional entrepreneurship culture measure is significant. Moreover, the size of the marginal effect of the regional entrepreneurial culture measure is approximately half the size of the individual entrepreneurial-personality profile. Even interpreted conservatively, the results suggest that

regional entrepreneurial culture matters and raises the likelihood of every inhabitant of a region to be an entrepreneur.

In Model 4 and 5 we test whether the proposed interaction between knowledge and entrepreneurial culture holds at the individual level. We have argued in the paper that a regional entrepreneurial culture makes individuals in such regions more likely to act upon new business opportunities. This is because individuals are more likely to act entrepreneurially if the regional traits, norms and values are in favor of entrepreneurship. Model 4 includes the interaction term between regional human capital and regional entrepreneurial culture and Model 5 includes the interaction between regional industry diversity and entrepreneurial culture. Although it is tempting to judge the interactions on the size and significance level of the interaction terms (both interaction terms are significant), we are aware that this can be misleading in non-linear models. Unlike standard OLS regressions, the "marginal effect of a change in both interacted variables is not equal to the marginal effect of changing just the interaction term" [13] (p. 154). Furthermore the significance of the interaction term cannot be judged base on the z-statistics. Norton and colleagues developed a more robust method to judge interaction terms. Unfortunately, the respective user programmed Stata "inteff" routine does not produce results in our sample. So we instead relied on the margins procedure in Stata to compute predicted probabilities at different values of regional knowledge and entrepreneurial culture. These predicted probabilities are displayed in Fig. A1 in S1 Supporting Information. Consistent with the hypothesis, the individual likelihood to be an entrepreneur is highest in regions with both high regional knowledge and regional entrepreneurial culture. The relationship between regional knowledge and individual entrepreneurship is much weaker in regions with a low entrepreneurial culture. Individuals living regions with high levels of knowledge and high entrepreneurial culture have on average an 8% higher likelihood of being an entrepreneur compared to regions with high levels of knowledge but low entrepreneurial culture. Additionally, at high levels of regional human

capital and regional industry diversity the 95% confidence intervals of the predicted probabilities of being an entrepreneur do not overlap when comparing regions with high and low entrepreneurial culture (summarized in Table A16 in S1 Supporting Information). This result suggests that the interactions are significant. Note that this result is controlled for the individual human capital of a person as well as the individual entrepreneurial personality profile.

One drawback of the models reported above is the use of a standard logistic regression for the analysis. Our data have a nested structure – individuals living in certain regions. Multi-level designs are better equipped to handle this embeddedness [14]. Following others we therefore applied a random-effect logistic regression model [15-17] and allowed the intercept to vary across regions. The results of the repeated test of the interaction hypothesis with multi-level methods are displayed in Models 6 and 7 (Table A15 in S1 Supporting Information). Again, we computed predicted probabilities at different values of regional knowledge and entrepreneurial culture. The plot of these predicted probabilities does not differ from the plots in Fig. S1 in S1 Supporting Information (and are thus not included here). Again, at high levels of regional human capital and industry diversity the 95% confidence intervals of the predicted probabilities of being an entrepreneur do not overlap at high levels of entrepreneurial culture. Note that one could also allow the slope of the individual regression coefficients to vary across regions but this requires a huge amount of computational capacity in a data set with +200.000 observations, +10 individual level explanatory variables and +300 regions which considerably exceeded the capacity of our equipment.

Eighth, the two personality datasets are remarkably representative of the local population regarding population size, ethnicity, education, and employment, but they are less representative for age and gender. To address this potential bias we again computed the

regional entrepreneurial culture indicators but this time we weighted the individual observations in the personality data set to match the age x gender distribution. Again the original effects were replicated (Table A17 in S1 Supporting Information).

Ninth and finally, start-up rates might not necessarily reflect high-impact entrepreneurship. To address this potential concern, we compare the regional distribution of the fastest growing firms in the US (Fortune 100) and GB (Fast Track 100). The majority of the results are reported in the Main paper. Here we present the analysis whether a region with above values in knowledge (human capital/industry diversity) and entrepreneurial culture have a higher likelihood of containing at least one of the Fortune 100 or Fast Track 100 firms then other regions. Tables A18 and A19 in S1 Supporting Information report the results for the US Fortune 100 firms. At least one Fortune 100 firm was located in around 22% of the regions exhibiting mean measures of knowledge and culture above the median. By contrast, at least one Fortune 100 firm was located in fewer than 4% of the regions exhibiting measures of knowledge and culture below the median. Chi2-tests confirm statistical significance of this difference ($\chi^2 = 32.5$, $p < 0.001$ for human capital and culture, $\chi^2 = 22.0$, $p < 0.001$ for industry diversity and culture). A similar pattern was observed for the data from Great Britain (Tables A20 and A21 in S1 Supporting Information). At least one Fast Track 100 firm was located in around one-fifth of the regions exhibiting high measures of knowledge and culture. By contrast, this held for fewer than 10% of the regions exhibiting low levels of knowledge and culture. Again this difference is statistical significant ($\chi^2 = 7.6$, $p < 0.05$ for human capital and culture, $\chi^2 = 7.9$, $p < 0.05$ for industry diversity and culture).

Note that this is again only correlational evidence. For example, there remains the possibility that these fast-growing firms were founded elsewhere and relocated to its contemporary location in search for example for qualified employees, venture capital or contacts to other entrepreneurial firms. While such relocation is not a typical behavior for firms we nevertheless made an effort to determine the region where the firm was founded. We

contacted the high-growth firms and searched their web pages and additional sources. For the US sample, we were able to determine the original region for 25 of the 86 fast-growing firms. 21 out of those 25 fast-growing firms (84%) stayed in their region where they were founded. For GB, we were able to determine the origin for 33 of the 100 fast-growing firms. Again the vast majority (25 out of 33 firms = 85%) did not relocate but stayed in their region where they were founded. This additional analysis suggests that relocation of fast-growing firms does not drive our regression results and does not lead to spurious correlations.

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Table A1. Descriptive statistics and correlation matrix in US MSAs

Variable	Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1) Entrepreneurship rate 2010	4.19	1.17	1.00																		
(2) Entrepreneurial culture	-20.29	0.38	0.36	1.00																	
(3) Agreeableness	3.65	0.05	-0.11	-0.13	1.00																
(4) Conscientiousness	3.52	0.05	-0.04	0.14	0.64	1.00															
(5) Extraversion	3.32	0.05	-0.00	0.41	0.36	0.22	1.00														
(6) Openness	3.67	0.06	0.39	0.25	-0.26	-0.23	-0.40	1.00													
(7) Neuroticism	3.00	0.05	-0.20	-0.61	-0.49	-0.36	-0.33	-0.00	1.00												
(8) Human capital (2006-2010)	25.36	7.81	0.28	0.36	0.02	-0.07	-0.08	0.34	-0.34	1.00											
(9) Industry diversity (2006-2010)	7.23	0.81	0.41	0.13	-0.05	0.05	0.01	0.17	-0.05	-0.11	1.00										
(10) Unemployment rate (mean 2006-2010)	6.75	2.01	-0.08	-0.06	-0.04	-0.03	-0.05	0.02	0.06	-0.45	0.05	1.00									
(11) Unemployment rate (delta 2006-2010)	108.64	52.20	0.54	0.24	-0.06	0.03	0.06	0.20	-0.11	0.01	0.27	0.11	1.00								
(12) Per capita income (mean 2006-2010)	35454.58	6538.06	0.36	0.23	-0.19	-0.20	-0.13	0.34	-0.11	0.61	0.28	-0.28	0.09	1.00							
(13) Per capita income (delta 2006-2010)	7.49	5.96	-0.42	-0.28	0.04	0.04	0.03	-0.33	0.21	-0.26	-0.30	-0.17	-0.53	-0.28	1.00						
(14) Migration (2006-2010)	0.57	0.45	0.10	0.25	-0.10	0.03	-0.11	0.18	-0.15	0.30	-0.12	-0.06	-0.01	0.16	0.13	1.00					
(15) Age group 25-44 (2006-2010)	25.96	2.13	0.02	0.17	0.02	0.04	-0.01	0.16	-0.15	0.24	0.29	-0.08	-0.14	0.24	-0.13	0.29	1.00				
(16) Population density (2010)	288.83	326.82	0.15	0.13	-0.10	-0.17	0.01	0.25	-0.01	0.31	0.20	0.05	0.12	0.51	-0.22	0.13	0.26	1.00			
(17) Population growth (2000-2010)	11.35	10.81	0.51	0.33	0.01	0.07	0.07	0.16	-0.26	0.11	0.25	0.02	0.42	-0.09	-0.25	0.22	0.23	-0.12	1.00		
(18) Region West	0.22	0.41	0.29	0.20	-0.09	-0.12	-0.28	0.36	-0.23	0.08	0.23	0.21	0.19	0.06	-0.27	0.14	0.09	-0.08	0.28	1.00	
(19) Region Midwest	0.25	0.44	-0.33	-0.01	0.06	0.05	0.18	-0.35	-0.03	0.05	-0.26	0.01	-0.24	-0.06	0.01	-0.18	-0.08	-0.04	-0.31	-0.31	1.00
(20) Region Northeast	0.12	0.33	-0.10	-0.15	-0.18	-0.27	-0.08	0.02	0.24	0.15	-0.18	-0.09	-0.15	0.23	0.21	-0.03	-0.15	0.28	-0.27	-0.20	-0.22

Correlation coefficients above 0.10 are significant at the 5% level

Table A2. Descriptive statistics and correlation matrix in GB LADs

Variable	Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) Entrepreneurship rate 2011	9.82	2.94	1																	
(2) Entrepreneurial culture	-20.79	0.42	0.58	1																
(3) Agreeableness	3.75	0.03	-0.20	-0.16	1															
(4) Conscientiousness	3.66	0.05	0.23	0.38	0.39	1														
(5) Extraversion	3.23	0.04	0.49	0.71	-0.06	0.10	1													
(6) Openness	3.65	0.05	0.19	0.44	-0.08	-0.22	0.22	1												
(7) Neuroticism	2.97	0.05	-0.42	-0.77	-0.24	-0.47	-0.46	-0.15	1											
(8) Human capital (2011)	30.48	8.23	0.45	0.51	-0.03	0.05	0.40	0.40	-0.40	1										
(9) Industry diversity (2011)	9.62	0.71	0.61	0.52	-0.10	0.20	0.50	0.09	-0.42	0.54	1									
(10) Unemployment rate (mean 2007-2011)	4.86	1.25	-0.49	-0.52	-0.16	-0.52	-0.27	-0.15	0.52	-0.54	-0.44	1								
(11) Unemployment rate (delta 2007-2011)	57.69	18.9	-0.24	-0.22	0.09	0.10	-0.16	-0.30	0.11	-0.28	-0.13	0.21	1							
(12) Per capita income (mean 2007-2011)	461.71	75.23	0.70	0.47	-0.15	0.21	0.46	0.06	-0.36	0.62	0.70	-0.52	-0.18	1						
(13) Per capita income (delta 2007-2011)	7.42	6.63	0.00	0.07	0.02	0.05	0.02	0.07	-0.04	0.03	0.00	-0.06	-0.07	0.01	1					
(14) Migration (2001)	0.45	0.39	0.36	0.4	-0.19	-0.05	0.34	0.3	-0.26	0.52	0.34	-0.26	-0.32	0.45	0.02	1				
(15) Age group 25-44 (2011)	25.23	2.97	0.01	-0.08	-0.34	-0.36	0.07	-0.09	0.18	0.09	0.13	0.36	-0.03	0.18	-0.07	0.42	1			
(16) Population density (2011)	938.42	1155.33	-0.05	-0.07	-0.30	-0.40	0.08	0.07	0.20	-0.04	0.04	0.52	-0.17	-0.10	-0.02	0.23	0.64	1		
(17) Population growth (2001-2011)	0.06	0.04	0.24	0.16	-0.13	0.04	0.05	0.09	-0.11	0.12	0.13	-0.10	-0.15	0.16	0.00	0.32	0.40	0.16	1	
(18) Region England	0.86	0.35	0.32	0.15	-0.20	0.22	0.13	-0.09	-0.02	-0.09	0.13	-0.08	-0.11	0.16	-0.06	0.10	0.07	0.17	0.17	1
(19) Region Wales	0.06	0.24	-0.19	-0.16	0.06	-0.21	-0.08	0.05	0.11	-0.08	-0.20	0.12	-0.10	-0.17	-0.02	-0.13	-0.09	-0.11	-0.09	-0.61

Correlation coefficients above 0.10 are significant at the 5% level

Table A3. [Replication of Table 1 from Main paper with all control variables]: Entrepreneurship rate, human capital, industry diversity, entrepreneurial culture, and interactions.

	Dependent variable: Entrepreneurship rate											
	US						GB					
Variables	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Human capital	0.19	*	0.14		0.18	*	-0.24		-0.27		-0.16	
	(0.08)		(0.08)		(0.08)		(0.17)		(0.16)		(0.16)	
Industry diversity	0.34	**	0.33	**	0.21	**	0.23		0.38	**	0.25	
	(0.06)		(0.06)		(0.06)		(0.14)		(0.14)		(0.13)	
Entrepreneurial culture	0.22	**	0.20	**	0.20	**	0.92	**	0.84	**	0.90	**
	(0.06)		(0.06)		(0.06)		(0.16)		(0.16)		(0.15)	
Interaction: Human capital X	----		0.11	*	----		----		0.53	**	----	
Entrepreneurial culture			(0.05)						(0.11)			
Interaction: Industry diversity X	----		----		0.19	**	----		----		0.54	**
Entrepreneurial culture					(0.05)						(0.10)	
Unemployment rate (mean)	0.02		0.03		0.02		-0.04		-0.17		-0.14	
	(0.07)		(0.07)		(0.06)		(0.17)		(0.17)		(0.16)	
Unemployment rate (change)	0.28	**	0.28	**	0.25	**	0.14		0.12		0.18	
	(0.05)		(0.05)		(0.05)		(0.11)		(0.11)		(0.11)	
Per capita income (mean)	0.09		0.11		0.10		2.12	**	1.80	**	1.81	**
	(0.06)		(0.06)		(0.06)		(0.14)		(0.15)		(0.15)	
Per capita income (change)	-0.12		-0.13		-0.12		-0.14		-0.12		-0.08	
	(0.07)		(0.07)		(0.07)		(0.11)		(0.11)		(0.11)	
Migration	0.14	*	0.14	*	0.12		-0.01		-0.13		-0.05	
	(0.06)		(0.06)		(0.06)		(0.15)		(0.15)		(0.14)	
Age group 25-44	-0.22	**	-0.23	**	-0.25	**	-0.65	**	-0.60	**	-0.61	**
	(0.06)		(0.06)		(0.06)		(0.17)		(0.16)		(0.16)	
Population density	0.13	**	0.14	**	0.14	**	0.91	**	0.87	**	0.93	**
	(0.02)		(0.02)		(0.02)		(0.12)		(0.12)		(0.11)	
Population growth	0.23	**	0.25	**	0.26	**	0.45	**	0.52	**	0.49	**
	(0.06)		(0.06)		(0.06)		(0.11)		(0.11)		(0.10)	
Region West	-0.22	*	-0.23	*	-0.24	*	----		----		----	
	(0.10)		(0.10)		(0.10)							
Region Midwest	-0.38	**	-0.36	**	-0.41	**	----		----		----	
	(0.11)		(0.11)		(0.11)							
Region Northeast	0.01		0.04		-0.07		----		----		----	
	(0.14)		(0.14)		(0.14)							
Region England	----		----		----		0.58		0.42		0.58	
							(0.39)		(0.38)		(0.37)	
Region Wales	----		----		----		0.24		0.08		0.11	
							(0.57)		(0.56)		(0.55)	
Constant	4.19	**	4.17	**	4.22	**	9.15	**	9.06	**	8.94	**
	(0.07)		(0.07)		(0.07)		(0.37)		(0.36)		(0.36)	
Observations	366		366		366		375		375		375	
Adjusted R^2	0.630		0.634		0.646		0.846		0.855		0.858	
F test	45.42	**	43.08	**	45.49	**	159.2	**	159.1	**	162.6	**
AIC	731.5		729		716		1477		1455		1448	

The independent variables are industry diversity, human capital, and entrepreneurial culture based on current residence. The OLS regressions are weighted by the number of observations per region in the personality data file giving more weight to regions with more observations. Displaying unstandardized coefficients and standard errors in parentheses. **, * = 1%, 5% significance level.

Table A4: **Entrepreneurship rate, human capital, industry diversity, entrepreneurial culture, and interactions – unweighted OLS results**

	Dependent variable: Entrepreneurship rate											
	US						GB					
Variables	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Human capital	0.15	*	0.15	*	0.15	*	-0.16		-0.15		-0.07	
	(0.07)		(0.07)		(0.07)		(0.15)		(0.14)		(0.14)	
Industry diversity	0.22	**	0.22	**	0.19	**	0.38	**	0.51	**	0.53	**
	(0.06)		(0.06)		(0.05)		(0.14)		(0.14)		(0.13)	
Entrepreneurial culture	0.09	*	0.10	*	0.12	**	0.68	**	0.73	**	0.83	**
	(0.05)		(0.05)		(0.05)		(0.13)		(0.12)		(0.12)	
Interaction: Human capital X			0.03						0.39	**		
Entrepreneurial culture			(0.04)						(0.09)			
Interaction: Industry diversity X					0.17	**					0.48	**
Entrepreneurial culture					(0.04)						(0.07)	
Unemployment rate (mean)	-0.03		-0.03		-0.03		-0.06		-0.16		-0.14	
	(0.05)		(0.05)		(0.05)		(0.17)		(0.16)		(0.16)	
Unemployment rate (change)	0.21	**	0.21	**	0.19	**	-0.09		-0.10		-0.04	
	(0.06)		(0.06)		(0.06)		(0.11)		(0.11)		(0.10)	
Per capita income (mean)	0.30	**	0.30	**	0.28	**	1.53	**	1.27	**	1.15	**
	(0.06)		(0.06)		(0.06)		(0.16)		(0.16)		(0.16)	
Per capita income (change)	-0.07		-0.07		-0.07		-0.08		-0.04		-0.02	
	(0.06)		(0.06)		(0.06)		(0.09)		(0.09)		(0.09)	
Migration	-0.02		-0.02		-0.03		0.04		-0.06		-0.05	
	(0.05)		(0.05)		(0.05)		(0.13)		(0.13)		(0.12)	
Age group 25-44	-0.27	**	-0.27	**	-0.28	**	-0.57	**	-0.50	**	-0.51	**
	(0.05)		(0.05)		(0.05)		(0.16)		(0.16)		(0.15)	
Population density	0.02		0.02		0.03		0.26		0.24		0.28	
	(0.05)		(0.05)		(0.05)		(0.15)		(0.15)		(0.14)	
Population growth	0.40	**	0.41	**	0.40	**	0.41	**	0.43	**	0.40	**
	(0.06)		(0.06)		(0.05)		(0.11)		(0.11)		(0.10)	
Region West	0.07		0.06		0.02		----		----		----	
	(0.12)		(0.12)		(0.11)							
Region Midwest	-0.41	**	-0.40	**	-0.45	**	----		----		----	
	(0.12)		(0.12)		(0.11)							
Region Northeast	-0.27		-0.25		-0.33	*	----		----		----	
	(0.16)		(0.16)		(0.15)							
Region England	----		----		----		1.50	**	1.40	**	1.48	**
							(0.37)		(0.37)		(0.35)	
Region Wales	----		----		----		0.79		0.69		0.65	
							(0.53)		(0.51)		(0.50)	
Constant	4.31	**	4.30	**	4.32	**	8.49	**	8.38	**	8.27	**
	(0.07)		(0.07)		(0.07)		(0.35)		(0.34)		(0.33)	
Observations	366		366		366		375		375		375	
Adjusted R^2	0.581		0.580		0.598		0.635		0.654		0.675	
F test	37.12	**	34.61	**	37.25	**	51.02	**	51.47	**	56.51	**
AIC	850.7		852.3		836		1508		1489		1466	

The independent variables are industry diversity, human capital, and entrepreneurial culture based on current residence. Unweighted OLS regressions. Displaying unstandardized coefficients and standard errors in parentheses. **, * = 1%, 5% significance level.

Table A5. Entrepreneurship, human capital, industry diversity, alternative entrepreneurial culture measure, and interactions.

	Dependent variable: Entrepreneurship rate											
	US						GB					
Variables	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Human capital	0.17	*	0.13		0.15		-0.25		-0.30		-0.19	
	(0.08)		(0.08)		(0.08)		(0.17)		(0.16)		(0.16)	
Industry diversity	0.33	**	0.32	**	0.22	**	0.28	*	0.44	**	0.31	*
	(0.06)		(0.06)		(0.06)		(0.14)		(0.14)		(0.13)	
Entrepreneurial culture	0.25	**	0.21	**	0.23	**	0.86	**	0.77	**	0.84	**
	(0.06)		(0.06)		(0.06)		(0.16)		(0.16)		(0.15)	
Interaction: Human capital X	----		0.09		----		----		0.48	**	----	
Entrepreneurial culture			(0.05)						(0.11)			
Interaction: Industry diversity X	----		----		0.15	**	----		----		0.56	**
Entrepreneurial culture					(0.04)						(0.09)	
Unemployment rate (mean)	0.02		0.02		0.01		-0.04		-0.18		-0.18	
	(0.07)		(0.06)		(0.06)		(0.17)		(0.17)		(0.17)	
Unemployment rate (change)	0.28	**	0.29	**	0.26	**	0.13		0.12		0.17	
	(0.05)		(0.05)		(0.05)		(0.11)		(0.11)		(0.11)	
Per capita income (mean)	0.11		0.13	*	0.13	*	2.10	**	1.83	**	1.77	**
	(0.06)		(0.06)		(0.06)		(0.14)		(0.15)		(0.15)	
Per capita income (change)	-0.11		-0.11		-0.10		-0.15		-0.14		-0.08	
	(0.07)		(0.07)		(0.07)		(0.11)		(0.11)		(0.11)	
Migration	0.14	*	0.15	*	0.12	*	-0.00		-0.10		-0.02	
	(0.06)		(0.06)		(0.06)		(0.15)		(0.15)		(0.14)	
Age group 25-44	-0.23	**	-0.23	**	-0.24	**	-0.60	**	-0.57	**	-0.54	**
	(0.06)		(0.06)		(0.06)		(0.17)		(0.17)		(0.16)	
Population density	0.13	**	0.13	**	0.14	**	0.92	**	0.92	**	0.93	**
	(0.02)		(0.02)		(0.02)		(0.12)		(0.12)		(0.11)	
Population growth	0.25	**	0.26	**	0.27	**	0.44	**	0.51	**	0.47	**
	(0.06)		(0.06)		(0.06)		(0.11)		(0.11)		(0.10)	
Region West	-0.16		-0.16		-0.14		----		----		----	
	(0.10)		(0.10)		(0.10)							
Region Midwest	-0.29	**	-0.28	*	-0.29	**	----		----		----	
	(0.11)		(0.11)		(0.11)							
Region Northeast	0.08		0.11		0.03		----		----		----	
	(0.14)		(0.14)		(0.14)							
Region England	----		----		----		0.55		0.36		0.55	
							(0.39)		(0.39)		(0.38)	
Region Wales	----		----		----		0.23		0.10		0.12	
							(0.58)		(0.56)		(0.55)	
Constant	4.15	**	4.13	**	4.14	**	9.17	**	9.14	**	8.97	**
	(0.07)		(0.07)		(0.07)		(0.37)		(0.37)		(0.36)	
Observations	366		366		366		375		375		375	
Adjusted R^2	0.636		0.638		0.649		0.845		0.852		0.859	
F test	46.51	**	43.96	**	45.93	**	157.6	**	154.7	**	163.2	**
AIC	725.9		724.2		713.6		1481		1464		1447	

The independent variables are industry diversity, human capital, and entrepreneurial culture based on current residence. The entrepreneurial culture measure is based on a linear composite by adding means of openness, conscientiousness, and extraversion, and then substracting means scores of neuroticism and agreeableness. The OLS regressions are weighted by the number of observations per region in the personality data file giving more weight to regions with more observations. Displaying unstandardized coefficients and standard errors in parentheses. **, * = 1%, 5% significance level.

Table A6. Entrepreneurship, human capital, industry diversity, neutral profile 1, and interactions.

	Dependent variable: Entrepreneurship rate											
	US						GB					
Variables	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Human capital	0.25	**	0.25	**	0.25	**	-0.08		-0.10		-0.13	
	(0.08)		(0.08)		(0.08)		(0.17)		(0.17)		(0.16)	
Industry diversity	0.38	**	0.38	**	0.38	**	0.43	**	0.46	**	0.47	**
	(0.06)		(0.06)		(0.06)		(0.14)		(0.15)		(0.14)	
Neutral profile 1	-0.07		-0.06		-0.07		-0.18		-0.19		-0.21	
	(0.05)		(0.06)		(0.05)		(0.13)		(0.13)		(0.13)	
Interaction: Human capital X	----		-0.05		----		----		-0.08		----	
Neutral profile 1			(0.06)						(0.12)			
Interaction: Industry diversity X	----		----		-0.00		----				-0.56	**
Neutral profile 1					(0.04)						(0.11)	
Unemployment rate (mean)	0.01		0.01		0.01		-0.12		-0.15		-0.28	
	(0.07)		(0.07)		(0.07)		(0.18)		(0.18)		(0.18)	
Unemployment rate (change)	0.31	**	0.31	**	0.31	**	0.33		0.34		0.32	
	(0.05)		(0.05)		(0.05)		(0.21)		(0.21)		(0.21)	
Per capita income (mean)	0.07		0.07		0.07		2.17	**	2.15	**	1.98	**
	(0.06)		(0.06)		(0.06)		(0.14)		(0.15)		(0.14)	
Per capita income (change)	-0.13		-0.12		-0.13		-0.14		-0.14		-0.10	
	(0.07)		(0.07)		(0.07)		(0.11)		(0.11)		(0.11)	
Migration	0.19	**	0.19	**	0.19	**	0.14		0.14		0.22	
	(0.06)		(0.06)		(0.06)		(0.15)		(0.15)		(0.14)	
Age group 25-44	-0.26	**	-0.25	**	-0.26	**	-0.83	**	-0.82	**	-0.69	**
	(0.06)		(0.06)		(0.06)		(0.18)		(0.18)		(0.17)	
Population density	0.15	**	0.14	**	0.15	**	1.06	**	1.07	**	1.05	**
	(0.02)		(0.03)		(0.02)		(0.12)		(0.12)		(0.12)	
Population growth	0.29	**	0.28	**	0.29	**	0.51	**	0.51	**	0.49	**
	(0.06)		(0.06)		(0.06)		(0.11)		(0.11)		(0.11)	
Region West	-0.17		-0.16		-0.17		----		----		----	
	(0.10)		(0.10)		(0.11)							
Region Midwest	-0.27	*	-0.26	*	-0.27	*	----		----		----	
	(0.12)		(0.12)		(0.12)							
Region Northeast	-0.01		-0.01		-0.01		----		----		----	
	(0.14)		(0.14)		(0.14)							
Region England	----		----		----		0.92	*	0.86	*	0.85	*
							(0.40)		(0.41)		(0.39)	
Region Wales	----		----		----		0.53		0.51		0.52	
							(0.60)		(0.60)		(0.58)	
Constant	4.18	**	4.18	**	4.18	**	8.77	**	8.81	**	8.78	**
	(0.07)		(0.07)		(0.08)		(0.38)		(0.39)		(0.37)	
Observations	366		366		366		375		375		375	
Adjusted R^2	0.619		0.619		0.618		0.833		0.833		0.844	
F test	43.29	**	40.45	**	40.29	**	144.6	**	134.1	**	145.7	**
AIC	742.7		743.8		744.7		1508		1509		1483	

The independent variables are industry diversity, human capital, and entrepreneurial culture based on current residence. Instead of the entrepreneurial constellation of the Big Five traits, a neutral profile is computed using each individual's deviations from the middle points in the Big Five Likert scales. The OLS regressions are weighted by the number of observations per region in the personality data file giving more weight to regions with more observations. Displaying unstandardized coefficients and standard errors in parentheses. **, * = 1%, 5% significance level.

Table A7. Entrepreneurship, human capital, industry diversity, neutral profile 2, and interactions.

	Dependent variable: Entrepreneurship rate											
	US						GB					
Variables	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Human capital	0.26	**	0.27	**	0.27	**	-0.05		-0.01		-0.07	
	(0.08)		(0.08)		(0.08)		(0.17)		(0.17)		(0.16)	
Industry diversity	0.39	**	0.39	**	0.36	**	0.41	**	0.39	**	0.40	**
	(0.06)		(0.06)		(0.06)		(0.14)		(0.14)		(0.14)	
Neutral profile 2	-0.03		-0.02		-0.01		0.20		0.21		0.18	
	(0.06)		(0.06)		(0.06)		(0.13)		(0.13)		(0.13)	
Interaction: Human capital X	----		-0.03		----		----		0.22		----	
Neutral profile 2			(0.06)						(0.13)			
Interaction: Industry diversity X	----		----		0.10		----				-0.25	*
Neutral profile 2					(0.05)						(0.12)	
Unemployment rate (mean)	0.02		0.02		0.02		-0.11		-0.08		-0.13	
	(0.07)		(0.07)		(0.07)		(0.18)		(0.18)		(0.18)	
Unemployment rate (change)	0.31	**	0.31	**	0.29	**	0.38		0.37		0.37	
	(0.05)		(0.05)		(0.06)		(0.21)		(0.21)		(0.21)	
Per capita income (mean)	0.06		0.05		0.05		2.22	**	2.24	**	2.20	**
	(0.06)		(0.06)		(0.06)		(0.14)		(0.14)		(0.14)	
Per capita income (change)	-0.13		-0.13		-0.13		-0.13		-0.13		-0.12	
	(0.07)		(0.07)		(0.07)		(0.11)		(0.11)		(0.11)	
Migration	0.19	**	0.19	**	0.19	**	0.17		0.15		0.18	
	(0.06)		(0.06)		(0.06)		(0.15)		(0.15)		(0.15)	
Age group 25-44	-0.25	**	-0.25	**	-0.27	**	-0.91	**	-0.91	**	-0.88	**
	(0.06)		(0.06)		(0.06)		(0.17)		(0.17)		(0.17)	
Population density	0.15	**	0.15	**	0.15	**	1.06	**	1.06	**	1.06	**
	(0.03)		(0.03)		(0.03)		(0.12)		(0.12)		(0.12)	
Population growth	0.28	**	0.28	**	0.29	**	0.51	**	0.52	**	0.50	**
	(0.06)		(0.06)		(0.06)		(0.11)		(0.11)		(0.11)	
Region West	-0.20		-0.19		-0.24	*	----		----		----	
	(0.10)		(0.10)		(0.10)							
Region Midwest	-0.31	**	-0.30	*	-0.36	**	----		----		----	
	(0.12)		(0.12)		(0.12)							
Region Northeast	-0.05		-0.05		-0.09		----		----		----	
	(0.14)		(0.14)		(0.14)							
Region England	----		----		----		1.10	**	1.22	**	1.06	**
							(0.40)		(0.41)		(0.40)	
Region Wales	----		----		----		0.66		0.74		0.64	
							(0.60)		(0.60)		(0.59)	
Constant	4.20	**	4.20	**	4.24	**	8.62	**	8.49	**	8.66	**
	(0.07)		(0.07)		(0.08)		(0.38)		(0.39)		(0.38)	
Observations	366		366		366		375		375		375	
Adjusted R^2	0.617		0.616		0.619		0.833		0.834		0.835	
F test	42.94	**	40.02	**	40.62	**	144.9	**	135.5	**	135.9	**
AIC	744.6		746.3		742.9		1507		1506		1505	

The independent variables are industry diversity, human capital, and entrepreneurial culture based on current residence. Instead of the entrepreneurial constellation of the Big Five traits, a neutral profile is computed using each individual's deviations from the mean values of the Big Five traits. The OLS regressions are weighted by the number of observations per region in the personality data file giving more weight to regions with more observations. Displaying unstandardized coefficients and standard errors in parentheses. **, * = 1%, 5% significance level.

Table A8. Entrepreneurship rate, industry diversity, single Big Five Traits, and interaction.

	Dependent variable: Entrepreneurship rate																	
	US									GB								
Variables	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6		
Human capital	0.18	*		0.14			0.17	*		-0.48	**		-0.46	*		-0.34		
	(0.08)			(0.09)			(0.08)			(0.18)			(0.18)			(0.18)		
Industry diversity	0.33	**		0.35	**		0.21	**		0.32	*		0.48	**		0.26		
	(0.06)			(0.06)			(0.07)			(0.15)			(0.15)			(0.14)		
Agreeableness	-0.21	**		-0.21	*		-0.19	*		-0.30	*		-0.34	*		-0.29	*	
	(0.08)			(0.08)			(0.08)			(0.14)			(0.14)			(0.13)		
Conscientiousness	0.15	*		0.14			0.16	*		0.19			0.21			0.25		
	(0.07)			(0.07)			(0.07)			(0.17)			(0.16)			(0.16)		
Extraversion	0.14	*		0.13			0.12			0.34	*		0.25			0.20		
	(0.06)			(0.06)			(0.06)			(0.14)			(0.14)			(0.14)		
Openness	0.28	**		0.26	**		0.26	**		0.65	**		0.53	**		0.46	**	
	(0.06)			(0.07)			(0.06)			(0.13)			(0.14)			(0.13)		
Neuroticism	-0.06			-0.07			-0.03			-0.17			-0.15			-0.20		
	(0.07)			(0.08)			(0.07)			(0.17)			(0.17)			(0.17)		
Int.: Bachelor X	----			-0.11			----			----			-0.24			----		
Agreeableness				(0.08)									(0.12)					
Int.: Bachelor X	----			-0.01			----			----			0.17			----		
Conscientiousness				(0.07)									(0.15)					
Int.: Bachelor X	----			0.03			----			----			0.34	**		----		
Extraversion				(0.06)									(0.13)					
Int.: Bachelor X	----			0.06			----			----			0.14			----		
Openness				(0.05)									(0.10)					
Int.: Bachelor X	----			-0.06			----			----			-0.04			----		
Neuroticism				(0.06)									(0.16)					
Int.: Industry diversity X	----			----			-0.13			----			----			-0.11		
Agreeableness							(0.08)									(0.13)		
Int.: Industry diversity X	----			----			0.03			----			----			0.13		
Conscientiousness							(0.07)									(0.13)		
Int.: Industry diversity X	----			----			0.06			----			----			0.17		
Extraversion							(0.05)									(0.12)		
Int.: Industry diversity X	----			----			0.08			----			----			0.47	**	
Openness							(0.04)									(0.09)		
Int.: Industry diversity X	----			----			-0.15	*		----			----			-0.04		
Neuroticism							(0.07)									(0.14)		
Unemployment rate (mean)	0.01			-0.01			-0.00			-0.26			-0.32			-0.28		
	(0.07)			(0.07)			(0.06)			(0.19)			(0.19)			(0.18)		
Unemployment rate (change)	0.28	**		0.28	**		0.26	**		0.21			0.17			0.17		
	(0.05)			(0.05)			(0.05)			(0.12)			(0.11)			(0.11)		
Per capita income (mean)	0.08			0.05			0.11			2.20	**		1.86	**		1.91	**	
	(0.06)			(0.07)			(0.06)			(0.15)			(0.17)			(0.15)		
Per capita income (change)	-0.09			-0.11			-0.10			-0.16			-0.17			-0.10		
	(0.07)			(0.07)			(0.07)			(0.11)			(0.11)			(0.11)		
Migration	0.14	*		0.14	*		0.12	*		-0.07			-0.15			0.13		
	(0.06)			(0.06)			(0.06)			(0.15)			(0.15)			(0.15)		
Age group 25-44	-0.25	**		-0.27	**		-0.27	**		-0.64	**		-0.64	**		-0.70	**	
	(0.06)			(0.06)			(0.06)			(0.18)			(0.18)			(0.17)		
Population density	0.11	**		0.11	**		0.12	**		0.85	**		0.78	**		0.78	**	
	(0.03)			(0.03)			(0.03)			(0.12)			(0.12)			(0.11)		
Population growth	0.27	**		0.29	**		0.30	**		0.45	**		0.51	**		0.46	**	
	(0.06)			(0.06)			(0.06)			(0.11)			(0.11)			(0.10)		
Region West	-0.19			-0.22	*		-0.21			----			----			----		
	(0.11)			(0.11)			(0.12)											
Region Midwest	-0.19			-0.12			-0.20			----			----			----		
	(0.12)			(0.12)			(0.12)											
Region Northeast	0.04			0.11			0.01			----			----			----		
	(0.14)			(0.15)			(0.15)											

Region England	----		----		----		0.59		0.39		0.81	*
							(0.40)		(0.40)		(0.38)	
Region Wales	----		----		----		0.12		-0.06		0.30	
							(0.57)		(0.56)		(0.54)	
Constant	4.17	**	4.13	**	4.17	**	9.14	**	9.14	**	8.84	**
	(0.07)		(0.08)		(0.07)		(0.38)		(0.38)		(0.36)	
Observations	366		366		366		375		375		375	
Adjusted R^2	0.644		0.645		0.653		0.849		0.856		0.867	
F	37.69	**	29.89	**	30.81	**	124.9	**	102.4	**	112.0	**
AIC	721.3		724.5		717.1		1474		1460		1431	

The independent variables are industry diversity, human capital and the single Big Five traits based on current residence. The OLS regressions are weighted by the number of observations per region in the personality data file giving more weight to regions with more observations. Displaying unstandardized coefficients and standard errors in parentheses. **, * = 1%, 5% significance level.

Table A9. Entrepreneurship rate, human capital, industry diversity, entrepreneurial culture, and interactions for 56 English Cities.

	Dependent variable: Entrepreneurship rate GB					
Variables	Model 1		Model 2		Model 3	
Human capital	-0.84		-1.23	**	-0.64	
	(0.50)		(0.38)		(0.34)	
Industry diversity	1.06	*	0.86	*	0.53	
	(0.46)		(0.35)		(0.31)	
Entrepreneurial culture	2.72	**	1.55	**	1.08	*
	(0.53)		(0.44)		(0.41)	
Interaction: Human capital X			1.02	**		
Entrepreneurial culture			(0.16)			
Interaction: Industry diversity X					1.02	**
Entrepreneurial culture					(0.13)	
Constant	9.27	**	8.62	**	8.77	**
	(0.31)		(0.25)		(0.22)	
Observations	56		56		56	
Adjusted R^2	0.840		0.909		0.928	
F test	97.21	**	137.6	**	178.0	**
AIC	230.9		200.5		187.1	

The independent variables are industry diversity, human capital, and entrepreneurial culture based on current residence. The OLS regressions in Models 1-3 are weighted by the number of observations per region in the personality data file giving more weight to regions with more observations. Displaying unstandardized coefficients and standard errors in parentheses. **, * = 1%, 5% significance level.

Table A10. Entrepreneurship rate, human capital, industry diversity, entrepreneurial culture based on youth residence, and interactions.

	Dependent variable: Entrepreneurship rate											
	US						GB					
Variables	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Human capital	0.22	**	0.20	*	0.20	*	-0.18		-0.22		-0.15	
	(0.08)		(0.08)		(0.08)		(0.17)		(0.17)		(0.16)	
Industry diversity	0.30	**	0.26	**	0.20	**	0.36	*	0.44	**	0.36	**
	(0.06)		(0.06)		(0.06)		(0.14)		(0.14)		(0.14)	
Entrepreneurial culture	0.26	**	0.25	**	0.21	**	0.60	**	0.56	**	0.57	**
	(0.06)		(0.06)		(0.06)		(0.13)		(0.13)		(0.13)	
Interaction: Human capital X	----		0.18	**	----		----		0.37	**	----	
Entrepreneurial culture			(0.06)						(0.11)			
Interaction: Industry diversity X	----		----		0.18	**	----		----		0.46	**
Entrepreneurial culture					(0.05)						(0.11)	
Unemployment rate (mean)	-0.00		0.00		0.00		-0.16		-0.24		-0.25	
	(0.06)		(0.06)		(0.06)		(0.17)		(0.17)		(0.17)	
Unemployment rate (change)	0.26	**	0.26	**	0.24	**	0.19		0.19		0.21	
	(0.05)		(0.05)		(0.05)		(0.12)		(0.11)		(0.11)	
Per capita income (mean)	0.04		0.05		0.06		2.16	**	1.99	**	1.96	**
	(0.06)		(0.06)		(0.06)		(0.14)		(0.15)		(0.15)	
Per capita income (change)	-0.14	*	-0.15	*	-0.15	*	-0.12		-0.10		-0.07	
	(0.07)		(0.07)		(0.07)		(0.11)		(0.11)		(0.11)	
Migration	0.20	**	0.20	**	0.18	**	0.09		0.03		0.07	
	(0.06)		(0.06)		(0.06)		(0.15)		(0.15)		(0.15)	
Age group 25-44	-0.23	**	-0.25	**	-0.24	**	-0.78	**	-0.75	**	-0.74	**
	(0.06)		(0.06)		(0.06)		(0.17)		(0.17)		(0.16)	
Population density	0.15	**	0.15	**	0.15	**	1.00	**	0.97	**	1.00	**
	(0.02)		(0.02)		(0.02)		(0.12)		(0.12)		(0.12)	
Population growth	0.20	**	0.21	**	0.22	**	0.50	**	0.54	**	0.52	**
	(0.06)		(0.06)		(0.06)		(0.11)		(0.11)		(0.11)	
Region West	-0.27	**	-0.31	**	-0.28	**	----		----		----	
	(0.10)		(0.10)		(0.10)							
Region Midwest	-0.45	**	-0.50	**	-0.48	**	----		----		----	
	(0.11)		(0.11)		(0.11)							
Region Northeast	-0.06		-0.07		-0.10		----		----		----	
	(0.13)		(0.13)		(0.13)							
Region England	----		----		----		0.79	*	0.71		0.77	*
							(0.39)		(0.39)		(0.38)	
Region Wales	----		----		----		0.36		0.27		0.24	
							(0.58)		(0.58)		(0.57)	
Constant	4.25	**	4.25	**	4.26	**	8.96	**	8.92	**	8.87	**
	(0.07)		(0.07)		(0.07)		(0.37)		(0.37)		(0.37)	
Observations	366		366		366		375		375		375	
Adjusted R^2	0.640		0.649		0.652		0.841		0.845		0.848	
F test	47.40	**	46.08	**	46.62	**	153.2	**	146.7	**	149.5	**
AIC	713.6		705.1		702.2		1490		1481		1475	

The independent variables are industry diversity, human capital and entrepreneurial culture based on youth residence. The OLS regressions are weighted by the number of observations per region in the personality data file giving more weight to regions with more observations. Displaying unstandardized coefficients and standard errors in parentheses. **, * = 1%, 5% significance level.

Table A11. Entrepreneurship rate, industry diversity, entrepreneurial culture (excluding all entrepreneurs in the personality data), and interactions in GB.

	Dependent variable: Entrepreneurship rate GB					
Variables	Model 1		Model 2		Model 3	
Human capital	-0.22		-0.27		-0.13	
	(0.17)		(0.16)		(0.16)	
Industry diversity	0.26		0.43	**	0.27	*
	(0.14)		(0.14)		(0.13)	
Entrepreneurial culture	0.80	**	0.76	**	0.83	**
	(0.16)		(0.15)		(0.15)	
Interaction: Human capital X	----		0.58	**	----	
Entrepreneurial culture			(0.11)			
Interaction: Industry diversity X	----		----		0.55	**
Entrepreneurial culture					(0.10)	
Unemployment rate (mean)	-0.06		-0.19		-0.14	
	(0.17)		(0.17)		(0.17)	
Unemployment rate (change)	0.15		0.12		0.17	
	(0.11)		(0.11)		(0.11)	
Per capita income (mean)	2.16	**	1.84	**	1.86	**
	(0.14)		(0.15)		(0.15)	
Per capita income (change)	-0.15		-0.14		-0.09	
	(0.11)		(0.11)		(0.11)	
Migration	0.01		-0.13		-0.03	
	(0.15)		(0.15)		(0.14)	
Age group 25-44	-0.69	**	-0.62	**	-0.66	**
	(0.17)		(0.16)		(0.16)	
Population density	0.93	**	0.88	**	0.93	**
	(0.12)		(0.12)		(0.11)	
Population growth	0.46	**	0.53	**	0.49	**
	(0.11)		(0.11)		(0.11)	
Region England	0.64		0.48		0.65	
	(0.39)		(0.38)		(0.38)	
Region Wales	0.30		0.15		0.17	
	(0.58)		(0.56)		(0.56)	
Constant	9.09	**	9.00	**	8.88	**
	(0.37)		(0.36)		(0.36)	
Observations	375		375		375	
Adjusted R^2	0.843		0.854		0.856	
F test	155.7	**	157.0	**	159.4	**
AIC	1484		1459		1454	

The independent variables are industry diversity, human capital and entrepreneurial culture based on current residence. The OLS regressions are weighted by the number of observations per region in the personality data file giving more weight to regions with more observations. Displaying unstandardized coefficients and standard errors in parentheses. **, * = 1%, 5% significance level.

Table A12: Entrepreneurship rate, human capital, and different versions of the creative class

Variables	Dependent variable: US Entrepreneurship rate													
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7	
Super creative core			-0.27	**										
(Florida)			(0.06)											
Creative professionals					-0.02									
(Florida)					(0.07)									
Creative class							-0.20	**						
(Florida)							(0.07)							
Super creative core									-0.14	*				
(McGranahan)									(0.06)					
Creative professionals											-0.02			
(McGranahan)											(0.07)			
Creative class													-0.14	+
(McGranahan)													(0.07)	
Human capital	0.19	*	0.39	**	0.20	*	0.32	**	0.30	**	0.20	*	0.29	**
	(0.08)		(0.09)		(0.08)		(0.09)		(0.09)		(0.08)		(0.09)	
Industry diversity	0.34	**	0.37	**	0.34	**	0.38	**	0.35	**	0.35	**	0.36	**
	(0.06)		(0.06)		(0.06)		(0.06)		(0.06)		(0.06)		(0.06)	
Entrepreneurial culture	0.22	**	0.19	**	0.22	**	0.21	**	0.21	**	0.22	**	0.21	**
	(0.06)		(0.06)		(0.06)		(0.06)		(0.06)		(0.06)		(0.06)	
Unemployment rate (mean)	0.02		0.10		0.03		0.06		0.04		0.03		0.04	
	(0.07)		(0.07)		(0.07)		(0.07)		(0.07)		(0.07)		(0.07)	
Unemployment rate (change)	0.28	**	0.27	**	0.28	**	0.28	**	0.29	**	0.28	**	0.29	**
	(0.05)		(0.05)		(0.05)		(0.05)		(0.05)		(0.05)		(0.05)	
Per capita income (mean)	0.09		0.11	+	0.09		0.12	*	0.11	+	0.09		0.11	+
	(0.06)		(0.06)		(0.06)		(0.06)		(0.06)		(0.06)		(0.06)	
Per capita income (change)	-0.12	+	-0.06		-0.12	+	-0.10		-0.10		-0.13	+	-0.12	+
	(0.07)		(0.07)		(0.07)		(0.07)		(0.07)		(0.07)		(0.07)	
Migration	0.14	*	0.14	*	0.14	*	0.12	+	0.14	*	0.14	*	0.13	*
	(0.06)		(0.06)		(0.06)		(0.06)		(0.06)		(0.06)		(0.06)	
Age group 25-44	-0.22	**	-0.15	*	-0.22	**	-0.17	*	-0.18	**	-0.22	**	-0.18	**
	(0.06)		(0.06)		(0.07)		(0.07)		(0.07)		(0.07)		(0.07)	
Population density	0.13	**	0.13	**	0.13	**	0.13	**	0.13	**	0.13	**	0.13	**
	(0.02)		(0.02)		(0.02)		(0.02)		(0.02)		(0.02)		(0.02)	
Population growth	0.23	**	0.22	**	0.23	**	0.21	**	0.22	**	0.23	**	0.22	**
	(0.06)		(0.06)		(0.06)		(0.06)		(0.06)		(0.06)		(0.06)	
Region West	-0.22	*	-0.17	+	-0.23	*	-0.26	**	-0.21	*	-0.23	*	-0.22	*
	(0.10)		(0.10)		(0.11)		(0.10)		(0.10)		(0.10)		(0.10)	
Region Midwest	-0.38	**	-0.42	**	-0.38	**	-0.41	**	-0.40	**	-0.38	**	-0.40	**
	(0.11)		(0.11)		(0.11)		(0.11)		(0.11)		(0.11)		(0.11)	
Region Northeast	0.01		0.03		0.01		0.02		-0.02		0.01		0.00	
	(0.14)		(0.14)		(0.14)		(0.14)		(0.14)		(0.14)		(0.14)	
Constant	4.19	**	4.26	**	4.20	**	4.26	**	4.23	**	4.20	**	4.23	**
	(0.07)		(0.07)		(0.08)		(0.08)		(0.07)		(0.07)		(0.07)	
Observations	366		366		366		366		366		366		366	
Adjusted R2	0.630		0.647		0.629		0.637		0.634		0.629		0.633	
F test	45.42		45.67		42.28		43.69		43.18		42.29		42.92	
AIC	731.5		715		733.5		725.7		728.5		733.4		729.9	

The OLS regressions are weighted by the number of observations per region in the personality data file giving more weight to regions with more observations. Displaying unstandardized coefficients and standard errors in parentheses. **, *, + = 1%, 5%, 10% significance level.

Table A13: Entrepreneurship rate, human capital, interactions, and different versions of the creative class

Variables	Dependent variable: US Entrepreneurship rate													
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7	
Super creative core			-0.26	**										
(Florida)			(0.06)											
Creative professionals					0.01									
(Florida)					(0.07)									
Creative class							-0.18	*						
(Florida)							(0.07)							
Super creative core									-0.13	*				
(McGranahan)									(0.06)					
Creative professionals											-0.00			
(McGranahan)											(0.07)			
Creative class													-0.12	+
(McGranahan)													(0.07)	
Human capital	0.14	+	0.34	**	0.14		0.26	**	0.25	*	0.14		0.23	*
	(0.08)		(0.09)		(0.09)		(0.09)		(0.10)		(0.09)		(0.10)	
Industry diversity	0.33	**	0.37	**	0.33	**	0.37	**	0.35	**	0.33	**	0.36	**
	(0.06)		(0.06)		(0.06)		(0.06)		(0.06)		(0.06)		(0.06)	
Entrepreneurial culture	0.20	**	0.17	**	0.19	**	0.19	**	0.19	**	0.19	**	0.19	**
	(0.06)		(0.06)		(0.06)		(0.06)		(0.06)		(0.06)		(0.06)	
Interaction: Human capital X	0.11	*	0.10	+	0.11	*	0.10	+	0.11	+	0.11	*	0.10	+
Entrepreneurial culture	(0.05)		(0.05)		(0.06)		(0.05)		(0.05)		(0.06)		(0.06)	
Unemployment rate (mean)	0.03		0.10		0.03		0.06		0.04		0.03		0.04	
	(0.07)		(0.07)		(0.07)		(0.07)		(0.07)		(0.07)		(0.07)	
Unemployment rate (change)	0.28	**	0.27	**	0.28	**	0.28	**	0.29	**	0.28	**	0.29	**
	(0.05)		(0.05)		(0.05)		(0.05)		(0.05)		(0.05)		(0.05)	
Per capita income (mean)	0.11	+	0.13	*	0.10		0.14	*	0.13	*	0.11	+	0.13	*
	(0.06)		(0.06)		(0.06)		(0.06)		(0.06)		(0.06)		(0.06)	
Per capita income (change)	-0.13	+	-0.06		-0.13	+	-0.11		-0.11		-0.13	+	-0.12	+
	(0.07)		(0.07)		(0.07)		(0.07)		(0.07)		(0.07)		(0.07)	
Migration	0.14	*	0.14	*	0.14	*	0.12	*	0.14	*	0.14	*	0.14	*
	(0.06)		(0.06)		(0.06)		(0.06)		(0.06)		(0.06)		(0.06)	
Age group 25-44	-0.23	**	-0.16	*	-0.23	**	-0.18	**	-0.19	**	-0.23	**	-0.19	**
	(0.06)		(0.06)		(0.07)		(0.07)		(0.07)		(0.07)		(0.07)	
Population density	0.14	**	0.13	**	0.14	**	0.13	**	0.13	**	0.14	**	0.13	**
	(0.02)		(0.02)		(0.02)		(0.02)		(0.02)		(0.02)		(0.02)	
Population growth	0.25	**	0.23	**	0.25	**	0.22	**	0.23	**	0.25	**	0.23	**
	(0.06)		(0.06)		(0.06)		(0.06)		(0.06)		(0.06)		(0.06)	
Region West	-0.23	*	-0.18	+	-0.23	*	-0.26	**	-0.22	*	-0.23	*	-0.23	*
	(0.10)		(0.10)		(0.11)		(0.10)		(0.10)		(0.10)		(0.10)	
Region Midwest	-0.36	**	-0.41	**	-0.36	**	-0.40	**	-0.39	**	-0.37	**	-0.39	**
	(0.11)		(0.11)		(0.11)		(0.11)		(0.11)		(0.11)		(0.11)	
Region Northeast	0.04		0.06		0.04		0.05		0.02		0.04		0.04	
	(0.14)		(0.14)		(0.14)		(0.14)		(0.14)		(0.14)		(0.14)	
Constant	4.17	**	4.23	**	4.17	**	4.24	**	4.21	**	4.17	**	4.20	**
	(0.07)		(0.07)		(0.08)		(0.08)		(0.07)		(0.07)		(0.07)	
Observations	366		366		366		366		366		366		366	
Adjusted R2	0.634		0.650		0.633		0.639		0.637		0.633		0.635	
F test	43.08		43.31		40.28		41.40		41.04		40.28		40.76	
AIC	729		713.6		731		724.4		726.5		731		728.2	

The OLS regressions are weighted by the number of observations per region in the personality data file giving more weight to regions with more observations. Displaying unstandardized coefficients and standard errors in parentheses. **, *, + = 1%, 5%, 10% significance level.

Table A14: Probability of being an entrepreneur in 22 occupational groups in GB

Occupation	Probability of being an entrepreneur	Difference of the average personality profile of self-employed and employed
Accounting / finance	.075	1.53
Administration	.022	1.11
Business development	.148	1.53
Consultancy	.370	1.08
Customer service	.036	1.51
Education / training	.050	0.91
Engineering / R and D	.071	1.65
Executive / senior management	.119	0.51
Healthcare	.063	1.49
IT	.108	1.58
General management	.058	0.70
Government / military	.003	2.49
Homemaker	.220	1.71
Legal	.112	1.40
Manufacturing / operations	.075	1.79
Media	.280	0.56
Medical / science	.061	0.57
Personnel	.044	1.50
Professional	.124	0.85
Purchasing	.044	2.15
Sales / marketing / advertising	.118	0.98
Skilled labour	.376	1.13
Other	.256	1.57

Table A15: Individual entrepreneurship, occupation and regional characteristics

	GB: Dependent variable: 1=being an entrepreneur, 0=paid employee								
	Model 1 - Base			Model 2 - Occupation			Model 3 - Region		
	Coef	Sig	AME	Coef	Sig	AME	Coef	Sig	AME
Individual level variables									
Age (in years)	1.107	**	0.101	1.319	**	0.109	1.328	**	0.109
	(0.037)		(0.003)	(0.039)		(0.003)	(0.040)		(0.003)
Age squared	-0.607	**	-0.056	-0.746	**	-0.061	-0.762	**	-0.063
	(0.035)		(0.003)	(0.037)		(0.003)	(0.038)		(0.003)
Gender (1=male; 0=female)	0.595	**	0.055	0.301	**	0.025	0.310	**	0.025
	(0.014)		(0.001)	(0.015)		(0.001)	(0.015)		(0.001)
Income (7 categories)	-0.030	**	-0.003	0.012		0.001	0.002		0.000
	(0.007)		(0.001)	(0.008)		(0.001)	(0.008)		(0.001)
White	-0.102	**	-0.009	-0.076	+	-0.006	-0.075	+	-0.006
	(0.039)		(0.004)	(0.042)		(0.003)	(0.042)		(0.003)
Asian	0.040		0.004	0.141	*	0.012	0.151	*	0.012
	(0.056)		(0.005)	(0.059)		(0.005)	(0.059)		(0.005)
Mixed	0.053		0.005	0.038		0.003	0.038		0.003
	(0.063)		(0.006)	(0.066)		(0.005)	(0.066)		(0.005)
Black	-0.143	+	-0.013	-0.080		-0.007	-0.080		-0.007
	(0.079)		(0.007)	(0.083)		(0.007)	(0.083)		(0.007)
Education	-0.027	+	-0.002	0.032	*	0.003	0.022		0.002
(1=at least bachelor degree)	(0.014)		(0.001)	(0.016)		(0.001)	(0.016)		(0.001)
Entrepreneurial personality	0.205	**	0.019	0.170	**	0.014	0.167	**	0.014
profile	(0.007)		(0.001)	(0.008)		(0.001)	(0.008)		(0.001)
Individual level occupations									
Accounting/finance				-1.542	**	-0.127	-1.543	**	-0.127
				(0.037)		(0.003)	(0.037)		(0.003)
Administration				-2.765	**	-0.228	-2.762	**	-0.227
				(0.047)		(0.004)	(0.047)		(0.004)
Business development				-0.869	**	-0.072	-0.867	**	-0.071
				(0.058)		(0.005)	(0.059)		(0.005)
Consultancy				0.216	**	0.018	0.207	**	0.017
				(0.034)		(0.003)	(0.034)		(0.003)
Customer service				-2.065	**	-0.170	-2.056	**	-0.169
				(0.053)		(0.004)	(0.053)		(0.004)
Education / training				-2.032	**	-0.167	-2.019	**	-0.166
				(0.031)		(0.003)	(0.031)		(0.002)
Engineering / R and D				-1.756	**	-0.145	-1.742	**	-0.143
				(0.050)		(0.004)	(0.051)		(0.004)
Executive / senior management				-1.523	**	-0.126	-1.529	**	-0.126
				(0.047)		(0.004)	(0.048)		(0.004)
Healthcare				-1.730	**	-0.143	-1.717	**	-0.141
				(0.036)		(0.003)	(0.036)		(0.003)
IT				-1.275	**	-0.105	-1.269	**	-0.104
				(0.033)		(0.003)	(0.033)		(0.003)
General management				-2.046	**	-0.169	-2.042	**	-0.168
				(0.056)		(0.005)	(0.056)		(0.005)
Government / military				-4.903	**	-0.404	-4.900	**	-0.402
				(0.190)		(0.016)	(0.190)		(0.016)
Homemaker				-0.309	*	-0.025	-0.324	*	-0.027
				(0.136)		(0.011)	(0.137)		(0.011)
Legal				-1.020	**	-0.084	-1.016	**	-0.083
				(0.052)		(0.004)	(0.052)		(0.004)

Manufacturing/operations		-1.745	**	-0.144	-1.708	**	-0.140
		(0.070)		(0.006)	(0.070)		(0.006)
Media		0.228	**	0.019	0.205	**	0.017
		(0.032)		(0.003)	(0.033)		(0.003)
Medical/science		-1.703	**	-0.140	-1.697	**	-0.139
		(0.046)		(0.004)	(0.046)		(0.004)
Personnel		-2.045	**	-0.168	-2.040	**	-0.168
		(0.101)		(0.008)	(0.101)		(0.008)
Professional		-1.105	**	-0.091	-1.092	**	-0.090
		(0.028)		(0.002)	(0.028)		(0.002)
Purchasing		-2.138	**	-0.176	-2.119	**	-0.174
		(0.146)		(0.012)	(0.146)		(0.012)
Sales / marketing / advertising		-0.947	**	-0.078	-0.951	**	-0.078
		(0.031)		(0.003)	(0.031)		(0.003)
Skilled labour		0.436	**	0.036	0.437	**	0.036
		(0.033)		(0.003)	(0.033)		(0.003)
Regional level variables							
Entrepreneurial culture					0.071	**	0.006
					(0.012)		(0.001)
Human capital					0.023		0.002
					(0.014)		(0.001)
Industry diversity					0.022	*	0.002
					(0.010)		(0.001)
Unemployment rate (mean)					-0.056	**	-0.005
					(0.014)		(0.001)
Unemployment rate (change)					-0.015	+	-0.001
					(0.009)		(0.001)
Per capita income (mean)					-0.009		-0.001
					(0.014)		(0.001)
Per capita income (change)					-0.018	*	-0.001
					(0.007)		(0.001)
Migration					0.037	*	0.003
					(0.017)		(0.001)
Age group 25-44					-0.203	**	-0.017
					(0.020)		(0.002)
Population density					0.113	**	0.009
					(0.019)		(0.002)
Population growth					0.041	**	0.003
					(0.010)		(0.001)
Region England					0.016		0.001
					(0.032)		(0.003)
Region Wales					0.092	+	0.008
					(0.047)		(0.004)
Constant	-2.401	-1.175			-1.207		
	(0.040)	(0.045)			(0.054)		
Observations	247,232	247,232			247,232		
Pseudo R^2	0.0536	0.165			0.168		
Wald Chi2	9001	27655			28162		

Table A15 (cont.): Individual entrepreneurship, occupation and regional characteristics

	GB Dependent variable: 1=Being an entrepreneur, 0=paid employee							
	Model 4 - Interaction Human Capital		Model 5 - Interaction Industry Diversity		Model 6 - Multilevel Human Capital		Model 7 - Multilevel Industry Diversity	
	Coef	AME	Coef	AME	Coef	AME	Coef	AME
Individual level variables								
Age (in years)	1.327 **	0.109	1.328 **	0.109	1.327 **	0.105	1.327 **	0.105
	(0.040)	(0.003)	(0.040)	(0.003)	(0.040)	(0.003)	(0.040)	(0.003)
Age squared	-0.762 **	-0.063	-0.762 **	-0.063	-0.763 **	-0.060	-0.763 **	-0.060
	(0.038)	(0.003)	(0.038)	(0.003)	(0.038)	(0.003)	(0.038)	(0.003)
Gender (1=male; 0=female)	0.310 **	0.025	0.310 **	0.025	0.313 **	0.025	0.313 **	0.025
	(0.015)	(0.001)	(0.015)	(0.001)	(0.015)	(0.001)	(0.015)	(0.001)
Income (7 categories)	0.002	0.000	0.002	0.000	0.004	0.000	0.004	0.000
	(0.008)	(0.001)	(0.008)	(0.001)	(0.008)	(0.001)	(0.008)	(0.001)
White	-0.075 +	-0.006	-0.075 +	-0.006	-0.074 +	-0.006	-0.074 +	-0.006
	(0.042)	(0.003)	(0.042)	(0.003)	(0.042)	(0.003)	(0.042)	(0.003)
Asian	0.151 *	0.012	0.151 *	0.012	0.157 **	0.012	0.157 **	0.012
	(0.059)	(0.005)	(0.059)	(0.005)	(0.059)	(0.005)	(0.059)	(0.005)
Mixed	0.038	0.003	0.038	0.003	0.037	0.003	0.037	0.003
	(0.066)	(0.005)	(0.066)	(0.005)	(0.066)	(0.005)	(0.066)	(0.005)
Black	-0.079	-0.006	-0.079	-0.007	-0.083	-0.007	-0.083	-0.007
	(0.083)	(0.007)	(0.083)	(0.007)	(0.083)	(0.007)	(0.083)	(0.007)
Education	0.022	0.002	0.022	0.002	0.020	0.002	0.020	0.002
(1=at least bachelor degree)	(0.016)	(0.001)	(0.016)	(0.001)	(0.016)	(0.001)	(0.016)	(0.001)
Entrepreneurial personality	0.167 **	0.014	0.167 **	0.014	0.168 **	0.013	0.168 **	0.013
profile	(0.008)	(0.001)	(0.008)	(0.001)	(0.008)	(0.001)	(0.008)	(0.001)
Individual level occupations								
Accounting/finance	-1.542 **	-0.127	-1.542 **	-0.127	-1.541 **	-0.122	-1.541 **	-0.122
	(0.037)	(0.003)	(0.037)	(0.003)	(0.037)	(0.003)	(0.037)	(0.003)
Administration	-2.761 **	-0.227	-2.761 **	-0.227	-2.756 **	-0.218	-2.756 **	-0.218
	(0.047)	(0.004)	(0.047)	(0.004)	(0.047)	(0.004)	(0.047)	(0.004)
Business development	-0.867 **	-0.071	-0.867 **	-0.071	-0.864 **	-0.068	-0.864 **	-0.068
	(0.059)	(0.005)	(0.059)	(0.005)	(0.059)	(0.005)	(0.059)	(0.005)
Consultancy	0.207 **	0.017	0.207 **	0.017	0.208 **	0.016	0.209 **	0.016
	(0.034)	(0.003)	(0.034)	(0.003)	(0.034)	(0.003)	(0.034)	(0.003)
Customer service	-2.056 **	-0.169	-2.056 **	-0.169	-2.054 **	-0.162	-2.054 **	-0.162
	(0.053)	(0.004)	(0.053)	(0.004)	(0.053)	(0.004)	(0.053)	(0.004)
Education / training	-2.019 **	-0.166	-2.019 **	-0.166	-2.017 **	-0.160	-2.017 **	-0.159
	(0.031)	(0.002)	(0.031)	(0.002)	(0.031)	(0.003)	(0.031)	(0.003)
Engineering / R and D	-1.741 **	-0.143	-1.741 **	-0.143	-1.732 **	-0.137	-1.732 **	-0.137
	(0.051)	(0.004)	(0.051)	(0.004)	(0.051)	(0.004)	(0.051)	(0.004)
Executive / senior management	-1.529 **	-0.126	-1.529 **	-0.126	-1.527 **	-0.121	-1.527 **	-0.121
	(0.048)	(0.004)	(0.048)	(0.004)	(0.048)	(0.004)	(0.048)	(0.004)
Healthcare	-1.716 **	-0.141	-1.716 **	-0.141	-1.714 **	-0.136	-1.714 **	-0.135
	(0.036)	(0.003)	(0.036)	(0.003)	(0.036)	(0.003)	(0.036)	(0.003)
IT	-1.269 **	-0.104	-1.269 **	-0.104	-1.264 **	-0.100	-1.263 **	-0.100
	(0.033)	(0.003)	(0.033)	(0.003)	(0.033)	(0.003)	(0.033)	(0.003)
General management	-2.041 **	-0.168	-2.041 **	-0.168	-2.041 **	-0.161	-2.041 **	-0.161
	(0.056)	(0.005)	(0.056)	(0.005)	(0.056)	(0.005)	(0.056)	(0.005)
Government / military	-4.900 **	-0.402	-4.900 **	-0.402	-4.903 **	-0.388	-4.903 **	-0.387
	(0.190)	(0.016)	(0.190)	(0.016)	(0.190)	(0.015)	(0.190)	(0.015)
Homemaker	-0.321 *	-0.026	-0.323 *	-0.027	-0.313 *	-0.025	-0.313 *	-0.025
	(0.137)	(0.011)	(0.137)	(0.011)	(0.137)	(0.011)	(0.137)	(0.011)

Legal	-1.016	**	-0.083		-1.016	**	-0.083		-1.020	**	-0.081		-1.020	**	-0.081	
	(0.052)		(0.004)		(0.052)		(0.004)		(0.053)		(0.004)		(0.053)		(0.004)	
Manufacturing/operations	-1.708	**	-0.140		-1.708	**	-0.140		-1.707	**	-0.135		-1.707	**	-0.135	
	(0.070)		(0.006)		(0.070)		(0.006)		(0.071)		(0.006)		(0.071)		(0.006)	
Media	0.205	**	0.017		0.205	**	0.017		0.195	**	0.015		0.195	**	0.015	
	(0.033)		(0.003)		(0.033)		(0.003)		(0.033)		(0.003)		(0.033)		(0.003)	
Medical/science	-1.695	**	-0.139		-1.696	**	-0.139		-1.688	**	-0.134		-1.688	**	-0.133	
	(0.046)		(0.004)		(0.046)		(0.004)		(0.046)		(0.004)		(0.046)		(0.004)	
Personnel	-2.039	**	-0.167		-2.039	**	-0.167		-2.028	**	-0.160		-2.028	**	-0.160	
	(0.101)		(0.008)		(0.101)		(0.008)		(0.101)		(0.008)		(0.101)		(0.008)	
Professional	-1.091	**	-0.090		-1.091	**	-0.090		-1.089	**	-0.086		-1.089	**	-0.086	
	(0.028)		(0.002)		(0.028)		(0.002)		(0.029)		(0.002)		(0.029)		(0.002)	
Purchasing	-2.118	**	-0.174		-2.119	**	-0.174		-2.119	**	-0.168		-2.120	**	-0.167	
	(0.146)		(0.012)		(0.146)		(0.012)		(0.146)		(0.012)		(0.146)		(0.012)	
Sales / marketing / advertising	-0.951	**	-0.078		-0.951	**	-0.078		-0.951	**	-0.075		-0.951	**	-0.075	
	(0.031)		(0.003)		(0.031)		(0.003)		(0.031)		(0.003)		(0.031)		(0.003)	
Skilled labour	0.436	**	0.036		0.437	**	0.036		0.437	**	0.035		0.437	**	0.035	
	(0.033)		(0.003)		(0.033)		(0.003)		(0.033)		(0.003)		(0.033)		(0.003)	
Regional level variables																
Entrepreneurial culture	0.077	**	0.007		0.074	**	0.006		0.062	**	0.005		0.059	**	0.005	
	(0.012)		(0.001)		(0.012)		(0.001)		(0.016)		(0.001)		(0.016)		(0.001)	
Human capital	0.030	*	0.003		0.026	+	0.002		0.036	+	0.003		0.032		0.003	
	(0.014)		(0.001)		(0.014)		(0.001)		(0.020)		(0.002)		(0.019)		(0.002)	
Industry diversity	0.030	**	0.002		0.026	*	0.002		0.046	**	0.004		0.044	**	0.004	
	(0.011)		(0.001)		(0.011)		(0.001)		(0.015)		(0.001)		(0.016)		(0.001)	
Interaction: Human capital X	0.033	**							0.024	*						
Entrepreneurial culture	(0.009)								(0.012)							
Interaction: Industry diversity X					0.013	+							0.011			
Entrepreneurial culture					(0.007)								(0.009)			
Unemployment rate (mean)	-0.067	**	-0.005		-0.060	**	-0.005		-0.063	**	-0.005		-0.058	**	-0.005	
	(0.015)		(0.001)		(0.014)		(0.001)		(0.020)		(0.002)		(0.020)		(0.002)	
Unemployment rate (change)	-0.015	+	-0.001		-0.014		-0.001		-0.024	+	-0.002		-0.023	+	-0.002	
	(0.009)		(0.001)		(0.009)		(0.001)		(0.012)		(0.001)		(0.012)		(0.001)	
Per capita income (mean)	-0.032	*	-0.003		-0.019		-0.002		-0.077	**	-0.006		-0.070	**	-0.006	
	(0.015)		(0.001)		(0.015)		(0.001)		(0.024)		(0.002)		(0.024)		(0.002)	
Per capita income (change)	-0.017	*	-0.001		-0.016	*	-0.001		-0.015	+	-0.001		-0.015		-0.001	
	(0.007)		(0.001)		(0.007)		(0.001)		(0.009)		(0.001)		(0.009)		(0.001)	
Migration	0.025		0.002		0.034	*	0.003		0.031		0.002		0.037		0.003	
	(0.017)		(0.001)		(0.017)		(0.001)		(0.023)		(0.002)		(0.023)		(0.002)	
Age group 25-44	-0.197	**	-0.016		-0.201	**	-0.017		-0.197	**	-0.016		-0.201	**	-0.016	
	(0.020)		(0.002)		(0.020)		(0.002)		(0.028)		(0.002)		(0.028)		(0.002)	
Population density	0.111	**	0.009		0.116	**	0.009		0.013		0.001		0.015		0.001	
	(0.019)		(0.002)		(0.019)		(0.002)		(0.034)		(0.003)		(0.034)		(0.003)	
Population growth	0.046	**	0.004		0.043	**	0.004		0.048	**	0.004		0.045	**	0.004	
	(0.010)		(0.001)		(0.010)		(0.001)		(0.014)		(0.001)		(0.014)		(0.001)	
Region England	0.007		0.001		0.016		0.001		0.059		0.005		0.066		0.005	
	(0.032)		(0.003)		(0.032)		(0.003)		(0.045)		(0.004)		(0.045)		(0.004)	
Region Wales	0.085	+	0.007		0.089	+	0.007		0.110	+	0.009		0.112	+	0.009	
	(0.048)		(0.004)		(0.048)		(0.004)		(0.064)		(0.005)		(0.064)		(0.005)	
Constant	-1.222				-1.215				-1.325				-1.323			
	(0.054)				(0.054)				(0.063)				(0.063)			
Observations	247,232				247,232				247,232				247,232			
Pseudo R^2	0.168				0.168				0.334				0.334			
Wald Chi2	28175				28165				21755				21748			
Number of groups	--				--				375				375			

Notes: Models 1-5 are standard logistic regressions; Models 6-7 random effects multilevel model. All non-binary variables are zstandardized. Displaying regression coefficients, average marginal effects (AME) and standard errors in parentheses. In order to compute the Pseudo R^2 in a multilevel setting, we follow recommendations of Snijders and Bosker (1999). According to them Pseudo R^2 is calculated by dividing the variance of the predicted residuals of the estimated model by the sum of (1) the variance of predicted residuals of the estimated model, (2) the level-2 variance and (3) the level-1 variance, which is equal to p2/3 in a logistic model. **, *, + = 1%, 5%, 10% significance level.

Table A16: 95% confidence intervals of the of the predicted probabilities to be an entrepreneur

		Entrepreneurial culture	
		1 SD below mean	1 SD above mean
Human capital	1 SD below mean	.096 - .101	.101 - .110
	1 SD above mean	.094 - .102	.113 - .119
Industry diversity	1 SD below mean	.096 - .101	.105 - .112
	1 SD above mean	.097 - .104	.112 - .118

Table A17. Entrepreneurship rate, human capital, industry diversity, entrepreneurial culture weighted by age and gender at the regional level, and interactions.

	Dependent variable: Entrepreneurship rate											
	US						GB					
Variables	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Human capital	0.23	**	0.18	*	0.20	*	-0.14		-0.15		-0.06	
	(0.08)		(0.08)		(0.08)		(0.17)		(0.16)		(0.16)	
Industry diversity	0.35	**	0.34	**	0.28	**	0.32	*	0.45	**	0.32	*
	(0.06)		(0.06)		(0.06)		(0.14)		(0.14)		(0.13)	
Entrepreneurial culture	0.19	**	0.17	**	0.19	**	0.58	**	0.57	**	0.60	**
	(0.06)		(0.06)		(0.06)		(0.14)		(0.14)		(0.13)	
Interaction: Human capital X	----		0.17	**	----		----		0.54	**	----	
Entrepreneurial culture			(0.06)						(0.11)			
Interaction: Industry diversity X	----		----		0.13	**	----		----		0.55	**
Entrepreneurial culture					(0.05)						(0.10)	
Unemployment rate (mean)	0.02		0.02		0.01		-0.09		-0.14		-0.13	
	(0.07)		(0.07)		(0.07)		(0.17)		(0.17)		(0.17)	
Unemployment rate (change)	0.29	**	0.29	**	0.28	**	0.16		0.16		0.20	
	(0.05)		(0.05)		(0.05)		(0.12)		(0.11)		(0.11)	
Per capita income (mean)	0.06		0.06		0.09		2.16	**	1.90	**	1.93	**
	(0.06)		(0.06)		(0.06)		(0.14)		(0.15)		(0.14)	
Per capita income (change)	-0.12		-0.13		-0.12		-0.13		-0.14		-0.07	
	(0.07)		(0.07)		(0.07)		(0.11)		(0.11)		(0.11)	
Migration	0.16	**	0.17	**	0.13	*	0.03		-0.06		-0.00	
	(0.06)		(0.06)		(0.06)		(0.15)		(0.15)		(0.15)	
Age group 25-44	-0.23	**	-0.25	**	-0.22	**	-0.76	**	-0.74	**	-0.76	**
	(0.06)		(0.06)		(0.06)		(0.17)		(0.16)		(0.16)	
Population density	0.14	**	0.14	**	0.13	**	1.02	**	0.97	**	1.03	**
	(0.02)		(0.02)		(0.02)		(0.12)		(0.12)		(0.11)	
Population growth	0.24	**	0.26	**	0.25	**	0.48	**	0.56	**	0.52	**
	(0.06)		(0.06)		(0.06)		(0.11)		(0.11)		(0.11)	
Region West	-0.22	*	-0.23	*	-0.23	*	----		----		----	
	(0.10)		(0.10)		(0.10)							
Region Midwest	-0.35	**	-0.32	**	-0.36	**	----		----		----	
	(0.11)		(0.11)		(0.11)							
Region Northeast	-0.01		0.05		-0.03		----		----		----	
	(0.14)		(0.14)		(0.14)							
Region England	----		----		----		0.77		0.65		0.72	
							(0.39)		(0.38)		(0.38)	
Region Wales	----		----		----		0.32		0.22		0.21	
							(0.59)		(0.57)		(0.56)	
Constant	4.20	**	4.17	**	4.19	**	8.97	**	8.88	**	8.85	**
	(0.07)		(0.07)		(0.07)		(0.38)		(0.37)		(0.36)	
Observations	366		366		366		375		375		375	
Adjusted R^2	0.625		0.634		0.633		0.840		0.849		0.852	
F test	44.54	**	43.13	**	42.90	**	151.9	**	151.3	**	154.9	**
AIC	736.1		728.7		730		1492		1471		1471	

The independent variables are industry diversity, human capital, and entrepreneurial culture based on current residence. The OLS regressions are weighted by the number of observations per region in the personality data file giving more weight to regions with more observations. Displaying unstandardized coefficients and standard errors in parentheses. **, * = 1%, 5% significance level.

Table A18. Number of regions with no Fortune 100 firm vs. at least one Fortune 100 firm by interaction groups (human capital and entrepreneurial culture) in the US.

	Interaction groups between human capital and entrepreneurial culture			
	low & low	low & high, high & low	high & high	Total
no Fortune 100 firm	121 (99%)	112 (92%)	94 (77%)	327 (89%)
at least one Fortune 100 firm	1 (1%)	10 (8%)	28 (23%)	39 (11%)
Total	122 (100%)	122 (100%)	122 (100%)	366 (100%)

Displaying number of regions and percentage of regions (in brackets). Both variables, human capital and the entrepreneurial culture were splitted at the median. Regions in the "low & low" column have below median values in human capital and the entrepreneurial culture. Regions in "low & high, high & low" column are above median in either human capital or the entrepreneurial culture. Regions in the "high & high" column have above the median values in human capital and entrepreneurial culture. $\chi^2 = 32.5$, $p < 0.001$.

Table A19. Number of regions with no Fortune 100 firm vs. at least one Fortune 100 firm by interaction groups (industry diversity and entrepreneurial culture) in the US.

	Interaction groups between industry diversity and entrepreneurial culture			
	low & low	low & high, high & low	high & high	Total
no Fortune 100 firm	105 (96%)	137 (93%)	85 (78%)	327 (89%)
at least one Fortune 100 firm	4 (4%)	11 (7%)	24 (22%)	39 (11%)
Total	109 (100%)	148 (100%)	109 (100%)	366 (100%)

Displaying number of regions and percentage of regions (in brackets). Both variables, industry diversity and the entrepreneurial culture were splitted at the median. Regions in the "low & low" column have below median values in industry diversity and the entrepreneurial culture. Regions in "low & high, high & low" column are above median in either industry diversity or the entrepreneurial culture. Regions in the "high & high" column have above the median values in industry diversity and entrepreneurial culture. $\chi^2 = 22.0$, $p < 0.001$.

Table A20. Number of regions with no Fast Track 100 firm vs. at least one Fast Track 100 firm by interaction groups (human capital and entrepreneurial culture) in GB.

	Interaction groups between human capital and entrepreneurial culture			
	low & low	low & high, high & low	high & high	Total
no Fortune 100 firm	116 (91%)	104 (87%)	101 (79%)	321 (86%)
at least one Fortune 100 firm	12 (9%)	15 (13%)	27 (21%)	54 (14%)
Total	128 (100%)	119 (100%)	128 (100%)	375 (100%)

Displaying number of regions and percentage of regions (in brackets). Both variables, human capital and the entrepreneurial culture were splitted at the median. Regions in the "low & low" column have below median values in human capital and the entrepreneurial culture. Regions in "low & high, high & low" column are above median in either human capital or the entrepreneurial culture. Regions in the "high & high" column have above the median values in human capital and entrepreneurial culture. $\chi^2 = 7.6$, $p < 0.05$.

Table A21. Number of regions with no Fast Track 100 firm vs. at least one Fast Track 100 firm by interaction groups (industry diversity and entrepreneurial culture) in GB.

	Interaction groups between industry diversity and entrepreneurial culture			
	low & low	low & high, high & low	high & high	Total
no Fortune 100 firm	122 (92%)	92 (83%)	107 (81%)	321 (86%)
at least one Fortune 100 firm	10 (8%)	19 (17%)	25 (19%)	54 (14 %)
Total	132 (100%)	111 (100%)	132 (100%)	375 (100%)

Displaying number of regions and percentage of regions (in brackets). Both variables, industry diversity and the entrepreneurial culture were splitted at the median. Regions in the "low & low" column have below median values in industry diversity and the entrepreneurial culture. Regions in "low & high, high & low" column are above median in either industry diversity or the entrepreneurial culture. Regions in the "high & high" column have above the median values in industry diversity and entrepreneurial culture. $\chi^2 = 7.9$, $p < 0.05$.

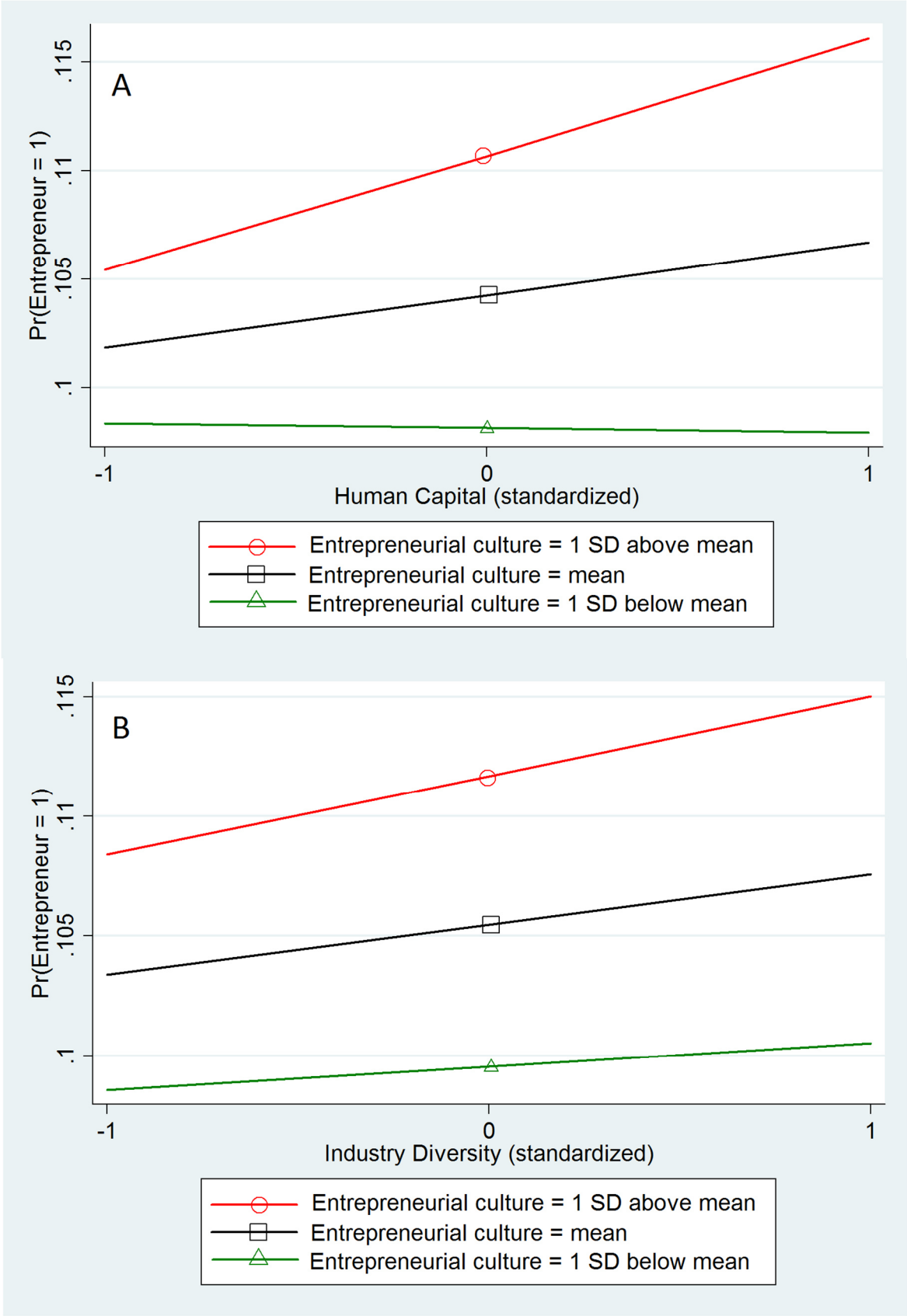

Fig A1. Interaction plots from logistic regression (GB, N = 375).
(A) Fig A1A (top): Human capital X Entrepreneurial culture. (B) Fig A1B (bottom): Industry diversity X Entrepreneurial culture.